Bell Telephone MAGAZINE

AUTUMN 1958

The Building Industry's Biggest Customer

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Bell Telephone Magazine

A non-technical review, published quarterly to give Bell System management people a broader view of the history, objectives, operations, and achievements of this business than they might attain in the course of their day-to-day occupations, and an added sense of participation in the problems and accomplishments of our nation-wide public service.

COVER: "The Building Industry's Biggest Customer." Painted for this MAGAZINE by *John Gaydos*

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A MEDIUM OF SUGGESTION and A RECORD OF PROGRESS

JUDSON S. BRADLEY, *Editor* SALVATORE J. TAIBBI, *Art Editor*

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FREDERICK R. KAPPEL, *President* S. WHITNEY LANDON, *Secretary* JOHN J. SCANLON, *Treasurer*

Who's Who & What's What In This Issue

Frederick R. Kappel

FREDERICK R. KAPPEL was elected president of the American Telephone and Telegraph Company on September 19, 1956. He had been president of the Western Electric Company, the manufacturing unit of the Bell System, since January 1, 1954. Mr. Kappel started in the plant department of the Northwestern Bell Telephone Company in 1924. In the next few years he held many assignments in the plant, engineering, and commercial departments — all in Minneapolis. Ten years after he had joined the Bell System, he went to Omaha as plant engineer of the Nebraska-South Dakota Area; and three years later he was plant operations supervisor on the staff of Northwestern Bell at Omaha. In 1939 he became assistant vice president of operations, and after three years he was elected vice president of operations and a director of the Northwestern Bell Telephone Company. He came to A. T. & T. in January, 1949, as assistant vice president in the Department of Operation and Engineering. In February of that year Mr. Kappel was elected vice president of the Long Lines Department. In November, 1949, he returned to the General Departments as vice president in charge of Operation and Engineering. He remained in this post until he became president of Western Electric. Of Mr. Kappel's several contributions to this MAGAZINE, the most recent is "Design for Service in a Growing Nation," which appeared in the issue for Spring 1958.

THE AUTHOR of this issue's "What It Means To Be America's #1 Builder" speaks with

Howard E. Phillips

authority, for he was graduated in both engineering and architectural engineering and is a licensed practitioner of the arts of Architecture and Engineering. HOWARD E. PHILLIPS was in the building contracting business, served with the United States Army Engineers, in the Navy with the Seabees in North Africa, and as a liaison officer in Washington, D. C. He joined the buildings group of A. T. & T.'s Department of Operation and Engineering in 1946; and in 1952 he went with Ohio Bell as building engineer. Two years later he returned to A. T. & T. as building engineer in O. & E. He is a member of the American Institute of Architects and of the American Society of Civil Engineers. He contributed "Architecture of Today's Telephone Buildings" to this MAGAZINE for Autumn 1956.

IT IS SOME YEARS since HAROLD R. HUNTLEY wrote "DB Rampant on a Field of Azure" for this MAGAZINE — the Winter 1953-54 issue. But those who recall his personal style of trenchant comment and whimsical expression will look forward to this newest contribution; and all who read it will sense

John H. Page

Harold R. Huntley

the depth of observation which lies beneath the surface. Joining the Wisconsin Telephone Company in 1917, as transmission and protection man, he took a year out to complete work for his B.S. degree. He returned to the Wisconsin Company in 1921 and subsequently became transmission and protection engineer, and in 1928 transmission engineer. In 1930 he moved to New York and A. T. & T., where he was an Operation and Engineering Department group head in the plant engineering division and later in charge of the groups handling electrical coördination and toll transmission. For five years beginning in 1951 he was transmission engineer and in 1956 he was assistant chief engineer. In 1957 he was director of customer products planning, and since August 1 of last year he has been Chief Engineer of the A. T. & T. Company. He is a Fellow of the American Institute of Electrical Engineers and a Senior Member of the Institute of Radio Engineers.

JOINING the Ohio Bell Telephone Company after service in the Navy in World War II, JOHN H. PAGE was a traffic assistant from 1946 to 1949. In the Public Relations De-

(Continued on page 58)

Items we have, shall have, and perhaps may have to offer customers to meet their expanding needs for service. *See page 31.*

Remarks at the General Assembly Meeting of the Telephone Pioneers of America at Chicago on September 17, 1958

THE WILL TO WORK TOGETHER

FREDERICK R. KAPPEL

President, AMERICAN TELEPHONE AND TELEGRAPH COMPANY

IN SUCH A GATHERING as this – the biggest get-together we telephone people have ever had – my thoughts turn naturally to the most important aspect of our business. This is – ourselves. Not only the Pioneers, but everybody who has a part in giving telephone service.

What is it that brings us together? Why are we here? What gets us up in the morning and on our way to work? I just now said it. We give telephone service.

Of course we are not merely members of an organization. We are individuals. And each of us wears more than one hat – one to work, and another to church, and another to vote, and another to go fishing, and so on.

We have our working lives, our family lives, and our political lives as citizens, and many of us have union lives as well.

Still and all, notwithstanding this wide variety of interests and activities, and our different personal goals, in our working lives we have a tremendous amount in common. We share a lot of important ideas. Some of these we don't even stop to think about in a conscious sort of way. I mean, we pretty much take them for granted. Let me mention just a few.

In the first place, we know what our job is – to give good communication service to the public. This is the responsibility we all share.

Second, we know our service is tremendously important. It is important to individuals – to industry – and to the whole economy. It is also vital to defense.

Third, the better and more valuable we make our service, the more people will want it, and the more jobs and opportunity there will be for the men and women in the business.

Fourth, to give good and improving service we need reasonable freedom. The business as a whole needs a fair chance to show what it can do, in the same way that individuals need a fair chance to show what they can do.

Fifth, the success of the business depends on all of us who are working at it.

Sixth and last, the personal progress and welfare of each one of us are directly tied

This is — ourselves. Not only the Pioneers, but everybody who has a part in giving telephone service.

up with the progress and success of the business.

I imagine all these points seem rather obvious to you. And you may be wondering why I stand here and talk about what you already know. I have more than one reason.

To begin with, I think most of us can gain something from deliberately pausing to consider how broad our common ground of understanding really is. There are nearly a million of us in the telephone industry in North America and we are bound to have many differences of opinion — as between different companies, across the bargaining table, and so on. But unless I am much mistaken, if we look at certain fundamentals honestly and objectively, we find infinitely more to unite us than to divide us.

It also seems to me that these fundamentals are pretty good bench marks to help us judge the meaning of events and the worth of various ideas both in and out of our business.

Take for example the very simple point that the more value we build into our service, the more saleable it becomes, and the more jobs and opportunity the business can offer.

You know as I do that starting about a year ago our rate of growth took a downward turn, and as a matter of fact we have somewhat less employment today than we had in 1957.

Let us suppose, however, that in all the years since the war we had made no effort to improve our service. Suppose we had not gone ahead with the dial program. Suppose we had no radio relay — no new PBX's — no color telephones or button telephones — no improvements in teletypewriters — no ocean cables — no short-haul carrier systems — and so on.

Under such circumstances our service today would have fewer capabilities – it would be less attractive – and it would cost more. It would be harder to sell in good times, and much harder to sell in a time of recession. So I feel sure that the improvements we have made in past years are largely responsible for our being able to continue to sell more service today. Needless to say, this has helped to keep many more jobs filled than would otherwise be possible.

I also spoke of reasonable freedom as one of the essentials we can all agree on. There are many ways to limit the freedom of a business, but I shall mention only two.

One way is to hold earnings down by regulation so that the business can't afford to do the things that produce progress. This is part of what has happened to the railroads, and it makes a sad story, as you well know. In our own case we have been squeezed very hard in the post-war years. It has been a big task – and it still is a big and everlasting task – to get public understanding and acceptance that good earnings are vital to progress and good service. We have had some success in this, but we still have much, much more to do.

What do I mean by "much, much more?" Naturally we must first of all show by our actions that we are sincerely and personally dedicated to giving our customers the best service we possibly can. But that in itself is not enough. We must also tell our story and tell it convincingly. We must do this in every community. We must see to it that the public really knows us, and that the public's representatives in government are directly and fully and honestly informed about what we are trying to do. If we are given treatment that we believe is wrong or short-sighted, we must say so and say why – and never stop working to get the situation corrected. When, on the other hand, regulators and legislators give us the means and encouragement to step up telephone progress, then we must work to the limit to justify their confidence. And I emhasize above all – these are not challenges to top management alone, but to every local telephone team. It takes all of us, and not some of us, to earn the financial freedom the business needs.

We must also tell our story and tell it convincingly . . . in every community.

. . . to reach solutions and decisions that we honestly believe are . . . in the best interest of all.

Another way to limit freedom is to have so many rules that people can hardly move around underneath them.

Of course any organization has to have some rules. But the function of a rule ought to be to help get things done in a sensible way, and not to hinder or prevent it. We have to keep flexible because we continuously have to deal with new situations that the old rules will not fit. For the sake of the business, the service, and our common welfare, I think we have to be on our guard against applying too many rules too rigidly.

Should higher management, for instance, require local managers to go always by the book, to the exclusion of their brains? Naturally not. It is much better to give people the chance to exercise and develop their brains. If we will do that, they will know when the book fits and when it doesn't.

Likewise, excessive rules and rigidity in job assignments block progress. In some industries this has long since become a heavy handicap. In them, regardless of practical needs, only certain people can do certain things, and some people are even required to sit around and do nothing. One man has to hold the tack while another lifts the hammer, and a third must be on hand to give them both a drink of water.

What is this called? This is featherbedding and it must not happen in our business. I ask you to test it against your own judgment of what is good for the business and for all the people in it.

Does it give freedom to make progress? Does it make service more valuable to the public? Does it make it more saleable, so that more people will want it? Does it give men and women the chance to show what they can do? And if the job happens to be a defense job, does it raise or lower the heavy cost we must all pay in taxes? I leave the answers to you.

LET ME REFER now to another of those basic principles I mentioned, which I can't help but think we all of us do believe in. I'll say it this time in a few different words but you will recognize the idea.

We *do* depend on the business and the business *does* depend on us. If we fall short of our best, the business will fall short too. And if the business falls short, the public will surely and quickly find that we have failed them.

To me it follows as night follows day that we – all of us – *must* be of one mind in *wanting* to solve all mutual problems on a basis that will be good for the business as a whole. I do not believe, for example, that "management" and "labor" can have divergent ambitions. We cannot serve the common good by aiming in opposite directions.

But let me be clear. Does this mean there is no room for disagreements? Of course it means nothing of the kind. It is in the very nature of things that we will have disagreements – and you will remember that at the beginning of this talk I remarked that we are all different individuals with many different interests and

views. Thank goodness that is so, because no one is smart enough to have all the answers.

What I do mean is this – that we have to have the determination and perseverance to reach solutions and decisions that we honestly believe are in the best interest, not of any particular individual, or of any particular company, or of any particular group – but in the best interest of all. If we have that kind of motive – that kind of ambition – that kind of will – that kind of courage – we need have no fears for the future.

In this business, and in this whole country, we need to work for unity. We have great opportunities, but every person who does not shut his eyes and ears to the facts knows that we also face great dangers and enormous risks. To meet them we must be united. However, we cannot achieve unity – we cannot even work for it – unless we first want and desire it, and are willing to sacrifice a little to get it. And if you ask yourself, "Do we really have to have it?", I think your own answer will be an unqualified "Yes." The French for years did not desire it, nor did they work for it, and so they lost it. Now they are in desperate straits to get it back. While we do not have some of their particular problems, let us never forget that we do have our own – and they are serious.

ONE OF THESE PROBLEMS that you and I – all of us here – are right in the middle of, is the relation between business and government.

The kind of government we have very largely determines the kind of business we have. Government can help to provide a good working climate – the kind that stimulates and encourages progress – or it can set conditions that penalize success, discourage initiative, and sap the strength and energy of business organizations.

How? You know as well as I. By driving earnings down, as I have already mentioned. By perpetuating bad taxes – the telephone excise tax for instance. By excessive interference in business operations. By making political capital out of attacks on organizations that happen to be big.

A related, critical, and never-ending problem is the problem of inflation. This is nourished both by government spending and by wage increases which add to the cost of countless products and services. Yet many individuals and groups today continue to promote so-called legislative "programs" which promise all things for all men. However, these same programs do not at all make clear on what basis everything that is promised will be paid for. In my own opinion they would intensify inflation, foster "boom and bust" psychology, and work a wrong on everyone – and most of all on people of modest means.

I CERTAINLY DO NOT ask you to take my opinion. But if we are going to achieve unity and make the most progress in this country, we have all got to work hard for answers that will serve the common interest. This means that as telephone people *and* as citizens we have to test our thinking in some very basic ways, and be completely honest and objective about it.

For example, as to any political plan or program, regardless of who proposes it, I think we need to ask –

"Will it benefit the whole community – or just some people at the expense of others?

"Is it good for the long run – or will it pile up more trouble later on?

"Is it sincere – or just smart politics?"

How each of us answers questions like

these is his affair and his alone. But I think it is vital that each of us should ask them, try to think them through, and come to the answer that best satisfies his reason and his conscience. If business and government today are interwoven – and they assuredly are – then it is self-evident that our individual lives and duties as citizens and as telephone people are interwoven also. They are not identical, of course, but they do go together. I repeat – the kind of government we have very largely determines the kind of business we have. And the kind of government any nation has depends on one factor alone – its people.

FINALLY, if the way we think has much to do with the way we work, it is equally true that the way we work has tremendous influence on the way others think, and on the degree of opportunity we are all given to serve the public well.

There is one basic charge on us, and that is to perform with excellence. Our responsibility is to excel. Generally through the years we have done just that. Under our free enterprise system we have pioneered and provided the best telephone service in the world, and this the whole world knows. The challenge now before us is to make this best even better – and to let nothing diminish our ability to do so.

We have better tools, better equipment, more knowledge, and more skill than we ever had before. We have markets to serve which I am certain will continue to grow. The horizon is boundless. But to maintain our full freedom to serve – to realize all the wonderful opportunities ahead – one thing is essential. We must work together.

I said a moment ago that with the will and courage to work for unity – to reach solutions that serve the common interest – we need not fear the future. I want to repeat and re-emphasize that now, and express my confidence in the good faith, the good will, and the abundant plain good sense of telephone people throughout the land. We *will* succeed – and I am sure too that, as always, the Pioneers will lead the way.

We have better tools, better equipment, more knowledge, and more skill than we ever had before.

Obligation and opportunity: To build well for the future of the service and to contribute to the well-being of every community in which we serve

WHAT IT MEANS TO BE AMERICA'S #1 BUILDER

HOWARD E. PHILLIPS

Building Engineer, DEPARTMENT OF OPERATION AND ENGINEERING, A. T. & T. CO.

WHEN A COMPILATION published in the August 1958 issue of *Architectural Forum* magazine revealed that the Bell System topped a list of the 100 corporations in this country which had spent the most in 1957 for building construction, that fact was widely reported. But, as is so often the case, headlines told only part – in this instance a very small part – of the story.

That fact is correct. The System spent $322,000,000 in this fashion in 1957. In that year it built 2,000 buildings – large and small, of all shapes and sizes, and for various purposes – in communities across the length and breadth of the land. The total is big: of its kind, the biggest – as the *Forum's* research shows. And yet, bigness is not an objective in itself; it might almost be said to be incidental to the main purpose pursued – which is to keep pace with the demands for more and more telephones and for the means to provide new and improved forms of communications and instruments and equipment to go with them.

What did the Bell System get for all this money? In brief, 14,000,000 gross square feet of added – and badly needed – floor space.

But that is a pretty flat and undescriptive definition of roofs and floors and walls and special construction to house the intricate equipment and business machinery and vehicles and people needed to interconnect today's 54,000,000 Bell telephones.

Nor is the Bell System by any means the sole beneficiary of its building program. Like the ever-widening circles which ripple across a quiet pond, the economic force of these millions spreads throughout the nation, in cities, towns, villages – wherever the work is done. Architects, contractors, craftsmen of many skills, unskilled labor – all have their share in the rewards which this growth stimulates. Behind them stand the suppliers – those who provide all kinds of materials, from steel beams to window glass. And, obviously, every municipality – large and small – where construction takes place benefits from the increase in taxes paid.

In another direction, the financial world is likewise concerned. For investors are called upon to help finance the System's

One of the 2,000 buildings erected last year.

building construction job. It is part of the capital investment that is raised through offerings of additional stocks and bonds.

The ultimate effects of the System's building program are widespread. Directly and indirectly it affects no inconsiderable portion of the American populace. In a sense it reflects A. T. & T. President Frederick R. Kappel's recent statement that "Big business does affect the lives of every one, and it must continuously prove by its actions that every one benefits."

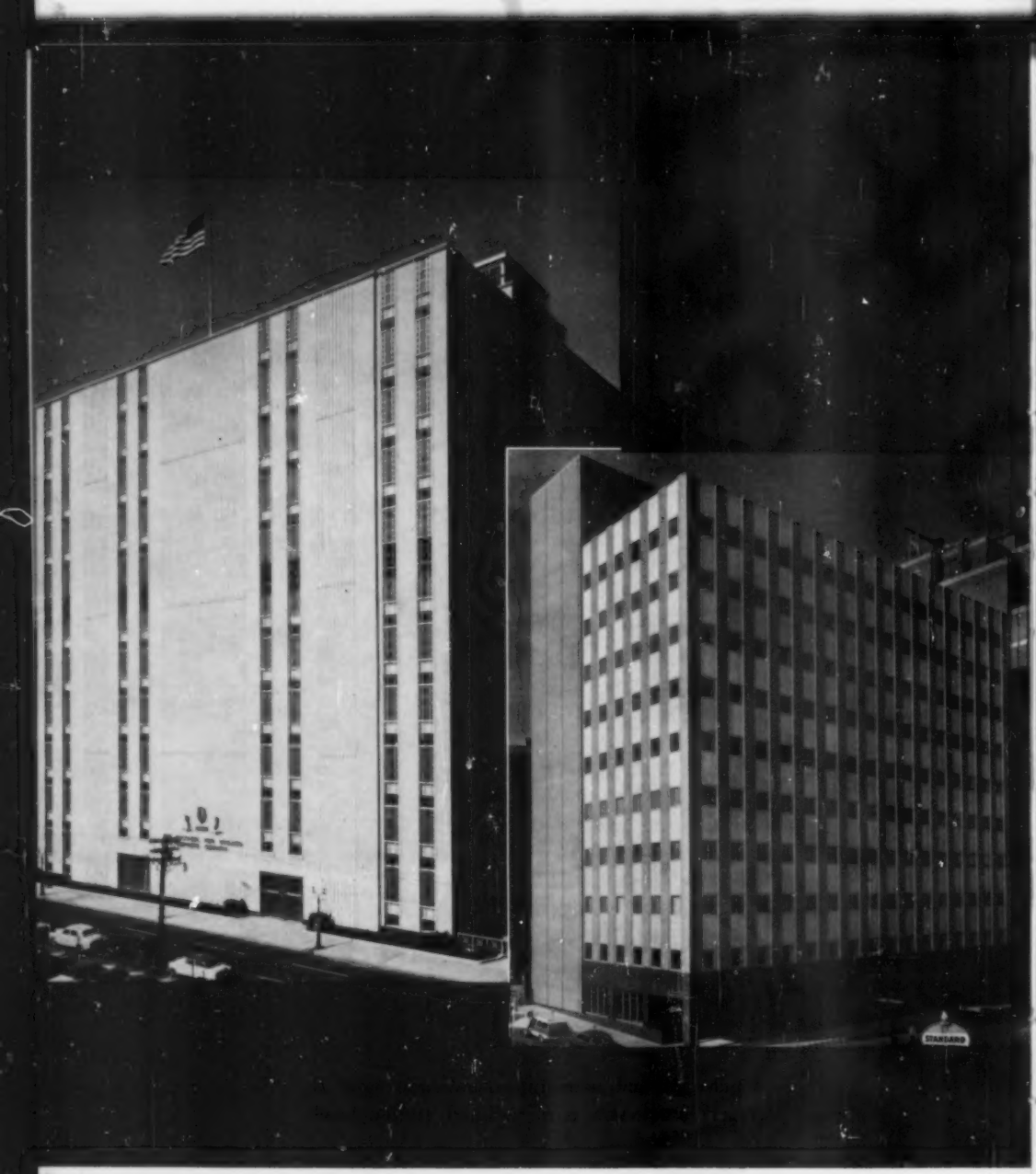
Many Sizes, Many Uses

THE 2000 buildings built last year, like all of the 15,000 owned by the System, display an astonishing variety in their size, use, and location. The simple community dial office in a pleasant Pacific Coast community, the outstanding headquarters building in a proud metropolis, the business-like garage in a Southern city, the heavy blast-resistant toll center on the outskirts of a great and populous center, the factory manufacturing telephone equipment, the accounting building with gleaming porcelain enamel walls, the little repeater station in an Iowa cornfield, the distributing house stocking telephone supplies, the two-story central office in a smaller city, the radio relay station in the Southwestern desert or perched high in the Rocky Mountains, the colonial business office on a New England village green: all these and countless others are part of the composite that is the System's building program.

A factor that sets our building projects apart from those of many business enterprises is their wide dispersal throughout the United States and Canada. Unlike the many corporations whose buildings are in vast installations in a single city, or even a dozen cities, ours are scattered widely throughout the areas we serve, appearing in almost every city, town, and hamlet, and even scattered through the open countryside along our maze of cable and radio relay routes. In the cities, our buildings are found throughout the downtown business centers, the industrial sections, and in the residential areas and suburbs. The need for locating our central offices at "wire centers" and our other buildings at strategic points spreads them so widely that almost everyone is familiar with the sight of at least a few of our structures.

Because of all this — the great numbers of our buildings and the wide dissemina-

Skeletons rise: some tall in big cities — some long and low in the suburbs.



tion of our locations – the Bell System finds itself in a unique position among business concerns. We are very much a part of the physical picture of modern life in all its aspects, business, industrial, residential, and rural. Far from confining ourselves to a few specialized locations, we are of necessity very much among the public and of the public. This intimate association of our buildings with the life of the nation has far-reaching implications for us. It imposes definite obligations upon us, and at the same time offers us singular opportunities to establish and cement good rela-

tions and understanding with the public.

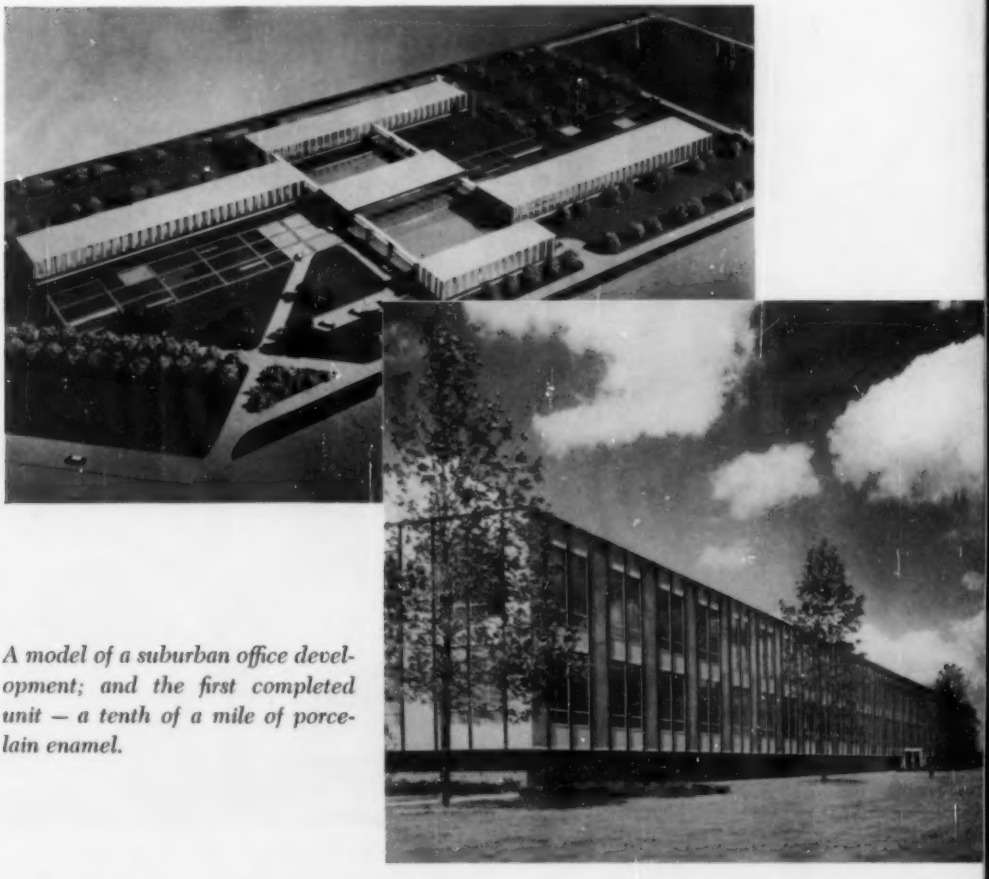
Let us consider these challenges as they relate, first, to ourselves as a business enterprise.

The Challenge to Us as a Business ...

OUR BUILDINGS are seen by many thousands of people every day, and by almost everyone on occasion. Next to the usual telephones in office, home, and outdoor booth, and the familiar telephone trucks, they are probably the physical thing that the public most often associates with the telephone company. A considerable part of the public's opinion of us as an organization is, consciously or unconsciously, formed by impressions of our buildings.

What do we want them to tell these people?

First, we want them to present the business in its true aspect as a stable, necessary, and dependable part of the community. This, we believe, our buildings have been saying for a good many years by their substantial and permanent construction that is essential to good telephone economics. Many of our buildings we will need for upwards of half a century, and the sort



A model of a suburban office development; and the first completed unit — a tenth of a mile of porcelain enamel.

of construction that makes that possible leaves its mark in appearance of stability. Furthermore, we know that it pays to be good housekeepers, and the neatness of our buildings and the freshness of our lawns has often attracted favorable comment.

But this traditional air of stability and good grooming is not enough — not nearly enough. The massive bank buildings of the early 1900's do that. Yet today they give the impression of extreme conservatism, if not stagnation — and so do a good many of our older buildings. The structures that we are erecting today should speak of a business that is highly progressive and forward looking. Our leadership in the arts of communication and electronics is outstanding. Our buildings are filled with marvelous devices that mark the most imaginative progress in communications. Our buildings, then, should give some hint of that energy and genius for progress that marks our technical growth. Fortunately, both architectural progress and the development of newer materials and techniques of construction favor this. A judicious employment of simplified and streamlined architectural concepts will often help.

Along with this greater eloquence of our buildings is the ever-present need for economy in first cost and upkeep of our buildings. We must be able to operate our business profitably, and extravagant expense in building construction has no part here. We have little need for monumental structures. Fortunately again, modern architectural ideas and materials lend themselves well to the need for economy, if careful judgment is used.

With all this, our buildings need to be easily identifiable as our own. When we build a structure of which we can be proud, one that speaks of a progressive, alert, yet stable organization, it does our public relations little good if no one can tell that it is a telephone building. The proper and gracious marking of our buildings in a pleasing and graceful manner, to the end that "he who runs may read," is getting serious study these days.

These, then, are some of the things that we owe ourselves in our buildings. To those among whom we live — the public — we also have definite obligations. It is a happy

Dial equipment buildings with business offices.

circumstance that these, in general, do not conflict with our obligations to ourselves.

Our Obligations to the Public

THE ARCHITECTURE of our buildings needs to be acceptable to the public, fitting in with and enhancing their surroundings and community. We do not need the most imposing structure in town . . . often our requirements are quite modest. But whatever the size of the building, its design cannot clash with the established character of the surroundings. This may dictate adherence to traditional styles in some locations, and a considerable degree of "modernism" in others. In any case, we owe it to our neighbors to have our buildings among the better examples of their style. Our presence should tend to lift, rather than retard, the neighborhood.

In planning buildings that give the impression of a progressive and forward-looking organization, the use of contemporary architectural forms and materials is often suitable. Care is needed, however, to avoid architectural expressions that are extreme, bizarre or faddish . . . designs that will not last long. This calls for nice discrimination on the part of the architect.

It is obvious that our neighbors will like us better if we can keep within the spirit as well as the letter of protective measures such as zoning ordinances. We should be extremely cautious about applying for exceptions, unless there is absolute necessity for them. Judgment in selecting sites, and ingenuity in avoiding the need for exceptions, will be amply repaid in finer public relations.

In sum, then, our obligations to the public consists in being good neighbors, mannerly with our buildings. A good question for ourselves is, "If I had my business or my home here, would I be happy with the telephone company's building?"

It's a Big Order

THIS IS a big order when you're building 2000 buildings a year, but we do most of the design work by engaging experts who are trained to do this work – the private architects and engineers throughout the country.

Experience in many big industries and government agencies has shown that design work that is "farmed out" has resulted in lower over-all costs; for in this way the owner's design and construction organization does not have great variations in size and changes in the work load. The telephone companies usually make similar arrangements with outside architects for the design of all major structures – their building engineers have a big enough job in coördinating the work of the architects, the equipment engineers, and the Western Electric Company installers when many buildings are being designed and built at the same time.

The telephone companies generally hire prominent architects in their community, preferably ones in the same city with the building engineer to permit closer coördination. However, if a job is too big for a local architect, one of the larger prominent architectural firms elsewhere is engaged. Where several buildings are in prospect, the telephone companies avail themselves of more than one architect, because it creates a competitive spirit which is healthy.

The Bell System has relied upon the architects to create beauty in our buildings within reasonable costs. And yet we, among other corporations, have been criticized by architects and in architectural magazines for obtaining mediocre architecture. When we have good architects, we should give them the latitude and authority that will enable their designers to create buildings that are beautiful.

A modern suburban accounting building.

Is Good Architecture Costly?

WE HAVE FOUND that good architecture costs no more than poor architecture. Even within the strict bounds of our economy, we are able to get good architecture without extra cost, and many of our best looking buildings are the lower cost ones.

Appearance is, of course, a matter of personal opinion. However, we have found that good architecture today is good because of its simplicity – you don't need costly materials to get good looks. Most modern architecture is considered artistic because of strictly functional forms. The more attractive buildings are usually achieved by a study of the composition rather than by how much decoration can be added. Good architecture is not dependent on the application of ornament for beauty: it is produced by suitable proportions, mass, composition, and by the successful handling of construction materials.

Closely associated with the building design is the important factor of location. Good design of an individual building does not assure good architecture without regard to placement on the lot and its surroundings. Above all, we should try to conserve any beauty that already exists in the area.

Good architecture, which is adapted to the surroundings and does not reflect luxury, can be the outward and visible sign of our regard for public approval. Our buildings are usually in the public eye, and they play no small part in the impression the public forms of us.

With each new building, we reflect our corporate character. We are stable, conservative, neat and well-maintained . . . but we should also reflect in our architecture

NEW JERSEY BELL TELEPHONE COMPANY

that our Company is a progressive organization.

A few examples of some of our good architecture are shown on these pages.

What Lies Ahead

WE'VE COME a long way from the very substantial but pretty stodgy architecture of our father's generation. We – and that means *all* the Companies – are working hard on building design problems. We are confident that we can increasingly make all our buildings assets to the community and visual symbols of a wise and progressive business.

One of the many microwave relay towers which provide necessary long distance channels.

Their singular responsibility for the investing of large sums of money emphasizes the important place of engineers on the Bell System management team

ENGINEERS: WHO AND WHAT THEY ARE — AND WHY

HAROLD R. HUNTLEY

Chief Engineer, AMERICAN TELEPHONE AND TELEGRAPH COMPANY

EDITOR'S NOTE: *Mr. Huntley has long been known among the engineering fraternity for both his stimulating ideas and his lively mode of expression. The editor has solicited this broad-gauge article in order to draw Mr. Huntley's far-seeing concepts to the attention of a wider readership. In a note accompanying his manuscript, Mr. Huntley said: "This article was written for non-engineers. It lays bare some of the innermost secrets of the engineering cult. If engineers read it, they do so at their own risk. It is not recommended to purists in the use of the English — or American — tongue." To which the editor would reply: "No apologies necessary."*

ENGINEERS form the largest single staff group in the Bell System. There are so many of them that one can hardly turn around without bumping into them. They are ubiquitous. But I suspect that unless you are an engineer, you don't know what they really do or why or how they do it. This lack of understanding of engineering on the part of non-engineers is not unique to the Bell System nor is it a new phenomenon; engineers have had this problem so long that they have become accustomed to it.

It is reported that Jim Hill — who was the moving spirit in the building of the Great Northern and Northern Pacific Railroads — used to refer to engineers as "necessary nuisances." And I suspect he had good reason. His engineers were probably like engineers of today — always telling him what to do and how to do it and how much it would cost. He could fuss and fume, but in the end he had to do what the engineers said, else he couldn't get his railroads built at all. It must have been very frustrating.

Cheops probably had the same trouble — some engineer was always telling him that he had to do it this way or that way if he really wanted the biggest and best pyramid in the world. Alexander the Great and Julius Caesar and all the rest certainly had the same problem; their engineers (or whatever they were called) probably kept

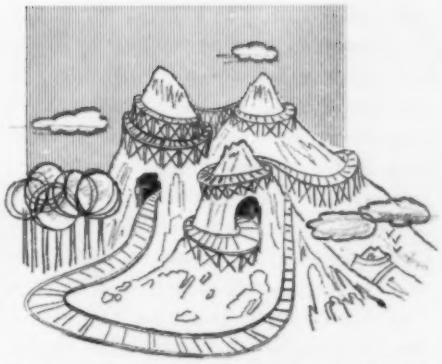
insisting that if they wanted to go wandering all over the world conquering this country and that, they had better be sure that they had a good system of roads and supply lines and communications in back of them or some day they would find themselves all alone by themselves with nowhere to go. And so it has been all through history.

It has been said that lawyers put their mistakes in jail, that doctors bury theirs, but that engineers build theirs into monuments for posterity to see. And certainly the monuments the old-time engineers built have lived far beyond the people who caused their building and the people who built them. For every person who knows about Jim Hill and the political and financial battles between Hill and Harriman – and the pitched battles between their construction crews – or who knows what the Macedonians were doing at the gates of India, or the Romans in Britain, there are many thousands who wonder – and perhaps marvel – at the engineering skill that carried pairs of rails around, over, and through the Rockies and the Cascades, or who look at the pyramids and wonder – or maybe marvel – at how the Egyptians ever got them so square or even got them built at all – or who see the graceful arches of the Roman aqueducts or the water supply system of pre-Roman Ostia (built of lead pipes and still capable of carrying water after more than 2,000 years) or the roads the Romans and the Macedonians and the Incas and many others built. And there are thousands who see that not all of the monuments these old-timers built were good; some of them simply represent tremendous wastes of resources in building structures which had no apparent use except to satisfy the whim of some ruler or very rich man who wanted to show off.

Modern engineers are of the same breed. They still build monuments which will outlive them. And some of their monuments are good and some are bad. And in many fields even he who runs can see these good monuments and the bad ones. He can see

"Cheops probably had the same trouble – some engineer was always telling him that he had to do it this way or that way . . ."

the bridges and tunnels that coördinate and smooth the flow of traffic around and over and through obstacles – and he can see the bridges and tunnels that are bottlenecks or that have been built over nonexistent rivers or that go nowhere. These things he can see and then form his own opinions.



". . . engineering skill that carried pairs of rails around, over, and through the Rockies and the Cascades . . ."

Now TELEPHONE ENGINEERS also build monuments. But in one respect they are smarter; they try to build their monuments smaller and more compact and more efficient, and then they try to put them out of sight. So these monuments become less and less visible not only to him who runs but even to many people in the telephone business itself. Just as one example, you may or may not have noticed that the vast array of poles and wires which used to decorate the country-side is gradually disappearing. Some of it is being put underground and some of it is being turned into radio. You can't see the underground stuff at all and all you can see of radio is a tower sticking up in the air here and there. Engineers don't do these kinds of things just for the fun of it; they do them because this is the way to give the best possible service at the least possible cost. But this very lack of visibility makes it even harder for non-engineers to understand engineering.

But visible or invisible, the monuments telephone engineers build cost money. And the process of getting this money is different in the modern age from what it was in the days of Cheops and Alexander the Great. In those days, if a ruler wanted a monument built he just went out and took the money he wanted away from people without ever worrying about what happened to them or about ever paying it back. But in a private enterprise, the engineer must use money which people entrust to him *voluntarily;* it either has been lent to the business by people who bought bonds or debentures or it belongs to people who own the business–the share owners.

Now this wouldn't upset the scheme of things except for one fact. The person whose money is being used to build these monuments usually isn't interested in monuments at all – particularly invisible ones. What he is interested in is what happens to his money – how safe it is and how much he earns on it. He relies on the engineers to build good monuments. But he always has control of his money and if he gets suspicious or thinks he can do better somewhere else, he will pull his money out. And if too many people pull their money out, the business will fail – regardless of how beautiful the monuments are.

So engineers must build the right kind of monuments. If one builds the wrong kind they will not produce the income and security that the people whose money he is using demand. And if he builds a wrong monument, it doesn't do him any good to tear it down and start all over again; all

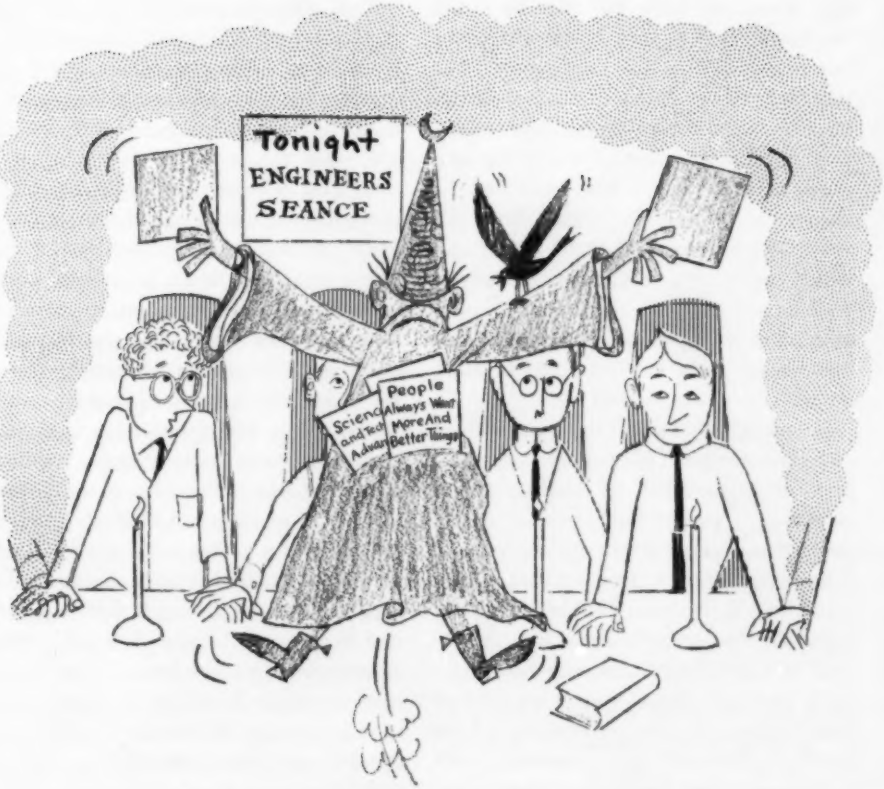
this means is that he has to earn on two monuments instead of one – the one he tore down and the new one. Because he can tear down a monument but he can't tear down the money which is invested in it. And – with few and unimportant exceptions – he can't get the money out by selling the monuments. Nobody would buy them, because they are of no use except as an integral part of the business. He does tear down a monument now and then – but only because it has outlived its usefulness and when by so doing he can improve the service or reduce the costs of running the business enough to make it worth while.

Now THIS PROBLEM of building the right kind of monuments is a very tricky one. In the first place, the engineer must look at every monument he builds not as a discrete thing; not simply as an ornament to embellish a structure, but as a basic part of it. And in the words of the politician, this structure extends "From the sun kissed shores of California to the rockbound coast of Maine and from border to border." And the different pieces of which this structure consist are being built by many engineers – 25,000 or so of them – and all of these pieces must fit together, else the whole structure will fall.

In the second place, if the whole structure is to produce the revenue which will keep lenders and owners happy to leave their money with us as long as private enterprise endures, it must be built for the future – not just with an eye to the future but *for* it. And at the same time it must do the best possible job today. And since Bell System engineers are investing money to the tune of a couple of billion dollars or more per year, they had better be right.

But the future is unknowable. Alexander Pope – or some equally erudite person – has said "There are no facts in the future." Nothing could be more true – as you can verify by comparing the prognostigations as to what is going to happen next week

". . . they try to build their monuments smaller and more compact and more efficient, and then they try to put them out of sight."



"So he keeps watching both wants and science."

or next month or next year with what actually does happen, in any field you want to pick – world affairs, economic conditions, the length of women's skirts, the sudden revival of hoops, how soon we will get a rocket to the moon, or anything else. And the same thing applies when one tries to predict what kind and how much telecommunication service people will want in the future and what science will make possible in the way of instrumentalities to provide these services. But the engineer must plan for this future, else sooner or later the structure he builds won't produce the earnings on which the whole enterprise depends.

And how does he do it? He starts by knowing two things: (1) that people always want more and better things than they have, and (2) that science and technology advance and can be made to produce more and better things. But he does not know precisely what advances in science will produce.

So he keeps watching both wants and science. He sees the direction in which each of them is going and he makes up his mind about the direction in which he should be going. And to help him see the direction in which he should be going, he follows Sir Winston Churchill's advice that he who looks back the farthest can

look ahead the best. And then he builds his monuments in such a way that if he has predicted the direction properly, he will be in clover. But also, since there are no facts in the future, he builds in such a way that if he has guessed wrong, the least possible harm will be done. And then he shapes the weddings between science and wants in such a way that the offspring – which are the pieces of hardware and systems he will use – are such that the future will fall as closely as possible into the pattern he wanted in the first place. In short, he plays both ends against the middle.

Le me give you one example of how engineers do this. This example is the impact of carrier and its relationship to switching. I picked this example not because it is necessarily the most important from the standpoint of the economic well-being of the business but because it is about the clearest-cut and easiest to follow. And I am not going to tell you what carrier is; if you don't know, you either haven't been reading this MAGAZINE–which I am sure the editor will regret – or you haven't understood what you read – which I regret, but am not going to do anything about.

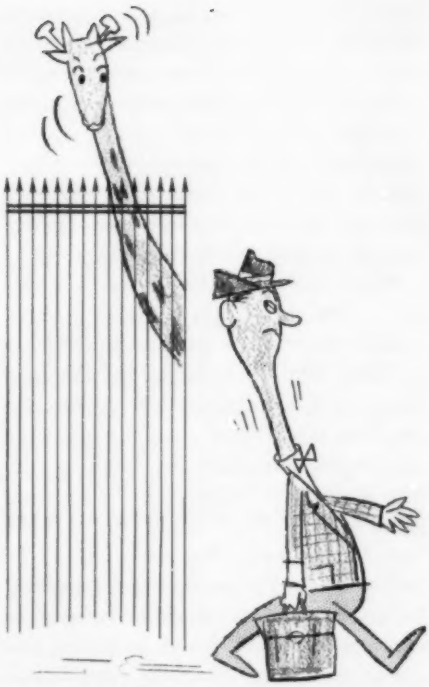
LET'S FOLLOW CHURCHILL'S advice and look back. Forty years ago–1918–the new-fangled Audion of de Forest, later called the vacuum tube and more recently the electron tube, was just coming into use for voice frequency repeaters, and people saw visions of being able, at long last, to extend the range of telephone transmission indefinitely and at reasonable cost. In that year a few people were intrigued with what we now call "carrier," but which was then often called "wired-wireless" – a contradiction of words if I ever heard one. But to most people wired-wireless was nothing but a scientific curiosity of extremely doubtful value. Ten years later – 1928 – carrier was a vigorous infant, but it was applied only to open wire lines and to most people it still looked as if it wouldn't cut much ice in the over-all scheme of things. By 1938 the whole outlook had been changed, because ways had been found to apply carrier to cable. By 1948 it had grown greatly in stature, because engineers had married need and science in a way that permitted carrier for the first time effectively to penetrate the short-haul field. In 1958 carrier is being used in quantities which only a few years ago would have been considered astronomical. Anybody could write the next sentence. By 1968 the number of systems will multiply again by a large factor; carrier will be coming into use for all trunks longer than a few miles and it will be beginning to have a significant impact on subscriber loop plant. Non-engineers will want to know in detail what kind of carrier it will be; engineers don't give a hoot–all they want is that it be cheaper and better, and they know that it will be.

Now all through this period switching has also been progressing. The main thing which has happened is, of course, a great expansion in dial operation both in the local plant and nation-wide. But the course of the dial switching art has been different from the course of carrier. Carrier has been making trunk circuits cheaper and at the same time it automatically makes them better transmission-wise. Getting things both cheaper and better is, of course, a thing greatly to be desired. But in dial switching we have not yet found this magic key. All through the period we have been talking about we have been making switching gear do more things better and faster. But the best we have been able to do from the economic standpoint is to keep the cost

from rising all out of bounds. The net result is that there has been a growing divergence between trunk and switching costs, so that our concept of the nation-wide dial switching network has been – and is – undergoing a rapid evolution. For the next few years, the main objective is how to use more of the cheaper trunk circuits and less of the more expensive switching gear.

But this also is a passing phase. Just as surely as the fact that carrier will get cheaper, electronics and more effective and economical logic and memory – just now beginning to give promise in switching – will let us find the magic key so that switching can do more things better and faster *and* cheaper. And this will cause a further rapid evolution in our thinking. Again, non-engineers will want to know in detail what kind of switching it will be; again, engineers don't give a hoot, as long as it is better and cheaper.

But there is no formula into which understanding of technical and economic fundamentals and of history and trends can be dropped and which will automatically produce the right view of the future. The really important ingredients are imagination, flexibility of mind, that nebulous thing called judgment, and the courage to do what judgment says should be done. Engineers know that there is never to be an end to progress; there is no such thing as standing still – one must progress or retrogress. He lets others talk about the "ultimate" but he knows that the ultimate will – and can – never be reached. All that he can hope for is that occasionally he can look back with a mite of satisfaction with what has been accomplished – but he dare stop only long enough to draw a deep breath before resuming the struggle. He accepts – and relishes – the fact that going around with his neck stuck out is his natural way of life.



". . . going around with his neck stuck out is his natural way of life."

And withal the engineer is a person just like any other person. He eats, drinks, sleeps, and thinks like any other person; en masse he displays the same wide range of characteristics and interests as any other group of people.

THERE ARE THOSE – mostly non-engineers, but including some engineers – who would make engineers appear as narrow technical specialists. Some people even insist that engineers need to be "humanized" – whatever that means. Poppycock – also balderdash. Outside of their chosen field, engineers can be just as right or just as wrong as anybody else in their views of world affairs, economics, politics, or any-

thing else. Engineers as a body contain about the same proportions as any other group of people who are cantankerous – or affable; of people who perform or appreciate fine music – or jazz; who are patrons of the arts – or the comics; who are hi-fi addicts – or don't know the difference between cabinet resonance and faithful reproduction of low frequencies.

About the only things I can think of that might distinguish a group of engineers from any other group are such things as these. While engineering has the same problems of coördination and organization structure as any other group, there is more opportunity in engineering for the person who wants to be a specialist than in most other parts of the business. And I guess that, by and large, engineers tend to be perfectionists. For example, if an engineer goes in for hi-fi he is likely to want an orchestra to sound like an orchestra, and not an assemblage of drums, cymbals and triangles. I even know engineers who think the girl star of a TV show should, in addition to being properly assembled of well designed parts, be able to *sing*.

In short, engineers are a group of people who are much like other people and who are part of the over-all management team of the business in the same way as other groups of people. They make their unique contribution to management in the same way as any other part of the organization makes its unique contribution. They must look upon themselves – and others must look upon them – simply as a part of this management team.

The only thing that distinguishes them from the other parts of the team is that, as I emphasized before, they travel a one-way street. They keep investing money irretrievably – and at the rate of a couple of billion dollars or so a year, it doesn't take long before they have built up quite a tidy little investment. And because of this fact, how well they invest this money – how good the monuments they build and pass on to posterity are – is the biggest single factor in the economic well-being of the enterprise ten, twenty, thirty and more years in the future. But this is not all. This investment must be used with maximum effectiveness if it is to produce the service and economies for which it was made. And so how closely and how well engineers work with the other parts of the business to this end is a major factor in the economic well-being of the enterprise today and every day.

But these things merely emphasize the importance of the management team concept. Any other concept simply means traveling the road of retrogression.

The goal is a complete marketing package, ready when the product is ready, based on an appraisal of the market and an analysis of all economic factors

MARKETING PLANNING FOR SALES AND PROFITS

JOHN H. PAGE

Marketing Engineer, DEPARTMENT OF OPERATION AND ENGINEERING, A. T. & T. CO.

WHEN MRS. AMERICA buys something, half of the price she pays is the cost of actually manufacturing the something and half is the cost of getting it to her and being sure she will want it. Broadly speaking, then, for the average product, half of the effort and work involved is manufacturing and half is marketing.

Whether this exact percentage applies to our business or to each of our specific services is academic, for the fact is that the marketing job we do will not only affect how much or how many we sell but also how profitable each transaction will be.

In the Bell System, recognition of the importance of this has been steadily increasing. To a degree, this is a reflection of the fact that we have emerged from the era of shortages and demand business; but it also is a recognition of the service and profit benefits that can accrue from a sound marketing job.

Marketing is not new, of course. It has existed in our business and others for many years, but in recent years it has become of age. New marketing tools have been developed, methods and approaches have been proven, and much of what was once a "seat of the pants" art has been reduced to a near science.

What is this near science? Its core is planning and coördination. Its goal — more profitable sales. A good salesman will make more sales than a poor one, but no salesman can work effectively without the support of marketing planning.

What are the elements of such planning?

First, they center around the product itself. A product must be saleable and it must be what customers want and will buy. The relatively new Western Electric model shop, which builds small numbers of various types of equipment for trial, has contributed greatly toward making this possible. Different types of equipment built in the model shop have been tested in every Company in the System. A total of 30 trials have been or are going on.

The trials vary to suit the equipment or service involved. In some cases the emphasis is mainly on the product itself. Will

it work efficiently, what features should be modified, and how do people react to its design? Other trials lay principal emphasis on identifying the market for the service or product. Who will buy it, how many can be sold, and what is the best selling method? But in all cases the customer is king. It is his evaluation, his opinion, that we are after.

For instance, early this year a new type of home communications system was built in the model shop and sold in three different cities. This system calls for intercommunicating between telephones, and a means whereby from any telephone a person can converse with someone at the front door. The front door "telephone" is not a traditional one but a combination loudspeaker and microphone which allows for hands-free operation.

We had a number of questions about this system. Was there any market for it at all? The answer came from actual sales experience. There is a market, but it is confined to larger homes. How about the door answering feature? From interviews we found that in half the sales this feature is why the customer bought. The interviews also suggested that people preferred voice signaling to bell signaling within the home, and as a consequence this feature will be included in the standard system. Thus we have a product which reflects the customers' ideas. It will be easier to sell because it does.

Good marketing rests on sound economic analysis. We must know our sales cost, our installation cost, our maintenance cost, and the capital investment involved. We must know these under a variety of circumstances: when a service or piece of equipment is sold by telephone, on a premise visit, as a substitution, or as a new installation. These must not only be reflected in the rates we charge but must guide us as to who in the business should sell what types of equipment and under what circumstances. This analysis must be the basis for our sales strategy, our training, and our promotional programs. When such strategy and programming is clear cut, the sales person need not involve himself in it but can concentrate on the actual day-to-day sales job, confident that each sale not only satisfies a customer but also is profitable to the Company. To a degree, this aspect of the job may be more difficult for us than many other businesses, because we do not sell our product outright. We own the equipment and service it throughout its life, and thus we must not only be concerned with insuring a profitable sale but must relate this to existing equipment and plant.

This is not an easy job, but it is important, and its very importance should be the incentive for us to find ways and means of doing the job better, with our goal to know who should sell what and under what circumstances.

An automobile without a battery is of little use and very hard to sell or use; and a new intercommunicating system without proper instructions for customers or without a good sales aid is hard to sell and use. Marketing planning must insure that these exist, that training material and installation material are available early in the game or when they are needed. Sales and training tools must not lag behind the equipment itself – otherwise sales themselves will lag.

Promotional material, too, must be integrated into the marketing plan. Our strategy must be clear. We must know what we want our advertising to do. Do we want it to generate a flood of calls to the business office? Or do we want to just

9 new services will be marketed in 1959

Marketing planning will not only help determine how many we sell but how profitable each transaction will be.

6A Key System — *Intercommunicating system — provides increased capacity and new features. Market will be found in nearly all sizes and types of business. Aggressive marketing will begin in early 1959.*

Call Director — *Streamlined unit to replace 101 key box — also has market for businessmen needing more than six buttons — 30,000 expected sales in 1959.*

Open Booth — *New low cost indoor public telephone mounting — in special locations its low capital cost will mean additional profit.*

6B Order Turret — *Medium sized call distribution system. Will economically fill need for customers needing 20-40 trunks. Airlines, Department Stores, Power Companies, Police Departments most likely customers.*

Drive-up, Walk-up Public Telephone — *These units, for outdoor use, will increase our line of pay station equipment and thus make possible more closely fitting the equipment to the location.*

Home Communications System — *This system will become available in mid-1959. Market is in medium and large homes.*

Farm Communications System — *Early trial results indicate a good reception for this comprehensive farm communications system. Available in mid-1959, 5,000 should be sold by the end of the year.*

New Small Telephone — *First production will appear in August 1959. Filling supply channels will allow for about 100,000 sales in 1959. Full national marketing won't begin until early 1960.*

Message Waiting Telephone — *Light on telephone which can be activated from central point indicates message waiting. Designed primarily for hotels, this service will find a market in other business.*

create an awareness of a given service or piece of equipment, so that it can be sold when the customer approaches us for other services. Too, the cost of advertising must be weighed; some items can be profitably advertised, others cannot. The important thing is that advertising and promotional schemes of other types be thought through, priced out, and integrated into the over-all marketing program.

THE GOAL, then, is a complete marketing package ready when the product itself is ready. The package must be based on an appraisal of the market and a realistic analysis of all economic factors: it must include training material, sales aids, an integrated promotional program, and a specific sales approach and strategy.

But we would be naïve if it didn't contain one other element: "feedback." We must know if our plan is working; we must be ready to adjust if it is not. To do this we must have sensitive measures of our effectiveness: how many of what was sold to whom. Not only will this allow the quick identification of weak and strong spots in our marketing program but it will also mean that sales and manufacturing can be closely integrated. We shouldn't be selling what we don't have on the shelf and we shouldn't have too many of anything on the shelf. Sensitive and current measures of what we are selling are a "must" if we are to meet this objective.

How is the System trying to put this type of marketing planning to work? We are just beginning, and at present a goodly proportion of our marketing planning is

The Call Director. Full marketing program for this equipment will be presented to all the Companies in meetings in October and November. This integrated interdepartmental program is designed to insure maximum sales and profits.

going into new services and products — some of which are still a year or more away from actual introduction.

Take the new small telephone, for instance. First, we had to find out if it was marketable at all at realistic prices. Actual sales test told us it was. Next, we needed to know how to price it — a recurring charge or a one time charge. Again, actual sales experience told us to use the recurring charge.

At this stage we know we have a marketable product in the small telephone and one which reflects customers' ideas and likes. But much more is needed. What colors should it be produced in? What should it be called? How should it be introduced? How should it be promoted? Should pricing reflect additional moneys for promotion? What means are needed to check the effectiveness of our sales? Answers to these questions, based on facts and research, are being evolved.

Customers, by giving us reactions to different types of equipment, make it possible for us to design customer oriented equipment — equipment customers will want and buy.

AT FIRST GLANCE some of these problems seem simple and possibly unimportant. For instance, take the matter of a name. Experience in outside industry shows that for certain products the name can have a critical effect on sales volume. This is especially true for mass volume items. We think this may be the case for the new small telephone. Many names have been seriously suggested; some accentuate glamour, some location, some size, some the night light feature. Which is right? Which will make customers want to buy? Working with actual customers and potential customers, we hope to come up with a sound answer.

But as work on these elements of marketing goes on, the broad marketing plan for the small telephone is evolving. Cost and profit analysis tell us we should design our promotion and sales training to sell these telephones as extensions on the normal in-movement of service. A hard look at expected production rates shows that although the first of these telephones will start coming off the line in August 1959, national sales won't be possible until the first quarter of 1960 because it takes close to 250,000 telephones to fill the System's supply lines.

This suggests introducing this telephone on an area-by-area basis. This approach has the additional advantage that it will let us test and improve promotional methods,

The decision to buy is a combination of many factors: the sales approach, the image that has been created by promotion, the price, and the product itself. Marketing planning is aimed at achieving a coordinated impact on the customer — not only to increase sales but to insure more profitable sales.

training and "feedback" methods on a small scale before they go into effect in all the companies. Too, the first six months of sales will allow us to predict reasonably accurately our future production needs. This we must do, for Western Electric will need reasonable advance notice if it is to increase its production capacities beyond the presently planned million-a-year level.

Besides the new telephone, we are currently working on marketing plans for the 6A intercommunicating system, the 600-type telephone (we think this will be named the Call Director), the message waiting light, the home and farm communications system, and others.

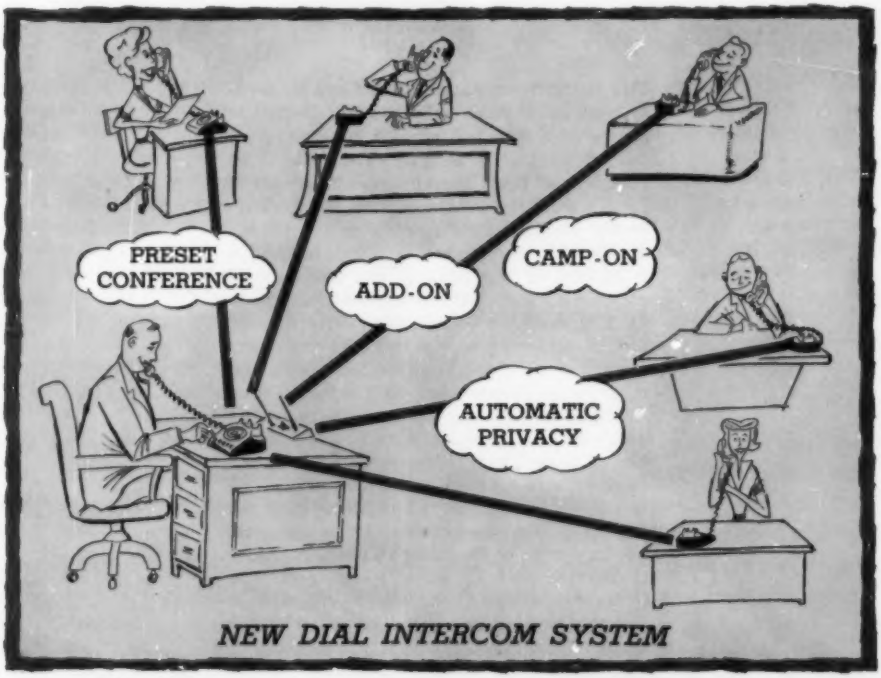
Obviously the marketing plan for each will differ, but so far, as we work on these, we seem to find three approaches which are common to all:

A willingness to accept as important various steps in marketing and thus give them the necessary effort and attention.

A willingness to let objectively measured customer reactions and opinions outweigh personal opinions and preconceived notions.

A willingness to dig out the economic facts about a given service or product and make them the basis for marketing planning.

Marketing planning, then, is nothing more than a willingness to put thought, work, and effort into those things other than the technical performance of the product itself. It is based on the concept that a good product will not automatically sell itself: that sales methods, sales training, promotion, the image the product creates, its design, its pricing, will and do very substantially affect how many we sell and how profitably we sell them. Marketing planning attempts to bring planning, direction, and coordination to this process. Obviously, many groups and departments are involved, and each must do its part. Each must contribute its own skill, but no one department can do the job – for it will be the impact of all of them together that



The 6A Intercommunicating System. As in the case of the Call Director, a full marketing program for this new more flexible intercommunicating system will be presented to all the Companies this fall. There is a very real opportunity to increase sales and profits through soundly conceived, enthusiastically executed marketing programs.

will affect the customer, that will motivate him to buy. And if our planning is realistic and sound, not only will customers get what they want but we will make a profit providing it to them.

Traditionally, we have laid heavy emphasis on high technical competence. The nature of our business demands this and will continue to demand it. An increase in marketing emphasis must not detract from this but rather be added on top of it. Certainly we will make mistakes in our effort to direct more attention to the marketing process. But the effort will be worth while and will pay off – for we know that at least a part of the work and, therefore, the cost and opportunity for profit, lies in the marketing area. We have today as fine a production and technical team as exists anywhere. It is, I think, fair to say that our competence and performance in the field of marketing is not equally outstanding. This is why it would seem that the greatest opportunity we have for improving profits and service lies in developing and vigorously exploiting the best marketing plans we can evolve. Certainly the opportunity appears to justify the effort.

THE RECENT CONFERENCE in Geneva, Switzerland, of internationally known scientists to discuss detection of nuclear tests, was attended by Dr. J. B. Fisk, Executive Vice President of Bell Laboratories, who served as Chairman of the Western group. Dr. Fisk recently returned from Geneva on completion of this work. Very favorable reports have been published on the work of the international committee, and much praise has been given Dr. Fisk and his fellow workers in the difficult task of achieving agreement between representatives of Russia, the United States and other countries in so complex a technical area. At the time of his appointment, the State Department described Dr. Fisk as "one of the United States' most distinguished scientists." In addition to his work at the Laboratories, he spent two years as Director of Research for the Atomic Energy Commission. He is currently a member of The President's Science Advisory Committee and a former member of The General Advisory Committee of the Atomic Energy Commission.

An early practitioner of sound public relations pointed out the path which the Bell System has followed positively for more than half a century

THEODORE VAIL'S PUBLIC RELATIONS PHILOSOPHY

CONNIE JEAN CONWAY

Staff Assistant, ALABAMA CUSTOMER RELATIONS SECTION, SOUTHERN BELL TELEPHONE AND TELEGRAPH COMPANY

NOTE: *Theodore Newton Vail was on two occasions a constructive force in the telephone business. From 1878 to 1887 he served as general manager of the National Bell Telephone Company and its successor companies, and put the infant industry on its feet and gave it a future. Again, returning to telephony upon his election as president of the American Telephone and Telegraph Company in 1907, he carried the expanding industry forward through good times and bad until his retirement in 1919. Prominent among his contributions to the Bell System during this second period was his recognition of the paramount importance of public opinion and his development of a broad, sound, constructive program of public relations.*

Regarding Vail as a pioneer in this field, Miss Conway, until last Spring a student of Journalism, studied his policies and practices and made him and them the subject of her Master's thesis, under the guidance of Associate Professor Scott M. Cutlip of the School of Journalism of the University of Wisconsin. The following paragraphs are selected from her paper. EDITOR.

ANY EFFECTIVE public relations program inevitably rests upon top management. It is top management which formulates policy – the public relations man's job is to serve as an adviser and carry out the policy decided upon. In the case of Vail and A. T. & T., he represented both top management and public relations. He not only formulated public relations policy, but saw that it was carried out – many times doing the job himself.

Vail's public relations with the general public was based upon (1) sound financial operations; (2) efficient, economic, and continually improving service in the public interest; (3) the providing of full and honest information regarding the company, its policies, and its purposes; and, (4) the creating of an "army of telephone personnel" trained to recognize and carry out their part as public relations representatives . . .

Probably the most quoted and certainly one of the most enlightening of Theodore N. Vail's statements pertaining to public opinion was made in 1910:

In all times, in all lands, public opinion has had control at the last word – public opinion is but the concert of individual opinion and is as much subject to change or education.

It is based on information and belief. If it is wrong, it is wrong because of wrong information and erroneous belief.

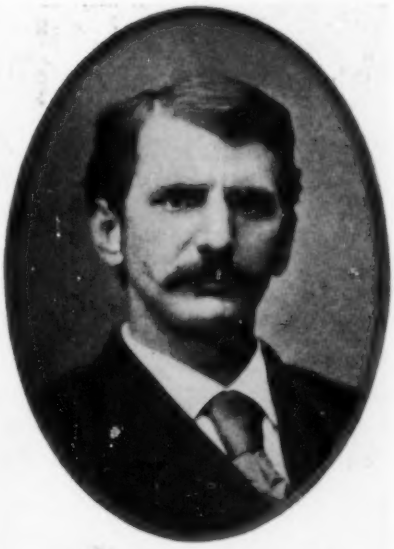
It is not only the right but the obligation of all individuals, or aggregations of individuals, who come before the public to see that the public has full and correct information.

Vail did not just suddenly come to this realization. It came about as a gradual process. In his early experience in the communication fields with the telegraph and mail services he had seen the power of public opinion when it was aroused. As early as 1879, only one year after he joined the Bell System, Vail wrote a New York telephone company official stressing the need to adopt the best system possible. Some four years later, in a letter to an official of an Associated Company, Vail showed his concern over whether the service rates were satisfactory to the public, whether rates could be reduced, whether they could be set up to bring the service within the reach of families, whether relationships between the company and the public had improved, and what was causing the existing conflicts.

Vail the Builder: A painting by Dean Cornwell which hangs in the Directors' Room of the New England Telephone and Telegraph Company in Boston.

The annual reports, personally written by Vail, covering the years 1907 through 1918, present the best view of his emphasis upon public opinion, the public interest, and service.

His first report after returning to the company asserts that only by fair rates could the Bell System provide for the public good service and "permanent, healthy conditions." This may seem mercenary, but few would argue its soundness. According to Vail, the fair rates were necessary in order to maintain efficient plants, equipment, and employees, and to meet the increased public demand for service. Vail expressed the belief that if the public had a full knowledge of the situation, they would agree to fair rates and that there would be no conflict between the company and the public. Revenue above such requirements was to be "used for the benefit of the public, allowing the company to retain a part sufficient to stimulate the most efficient and economical management."



Theodore N. Vail in 1878.

Responsibility to the Public

COMMENTING ON THE YEAR 1908, Vail stated that the public was not only better informed, but was beginning to recognize what the Bell System meant to the community at large. He said that if the type of service found in most countries of the world were found in the United States there would be "waiting, idle and patient [impatient] customers," rather than "waiting and idle operators and facilities." "We do not think the American public desires this kind of service," he continued.

It was in this year that A. T. & T. launched a national advertising program designed to give the public a better understanding and appreciation of the Bell System.

Vail's concept of the company's responsibility to the public is quite clearly stated in the 1909 annual report. In this report he asserts:

> It is the duty and obligation, as well as self-interest, of a public service corporation to give efficient service up to the limits of reasonable practicability and to furnish such service at a reasonable price.
>
> Public utility companies have obligations and are responsible both to the public and to their shareholders. It is a responsibility with accountability.

Thus Vail early realized certain obligations and responsibilities which a public service corporation has to the public.

One universal interconnecting system was Vail's dream, which, he said in the 1910 annual report, could "only be brought about by putting before the public the fullest and most detailed information as to the company, its policy, and purposes." In this same report Vail "linked public relations with public opinion" in his statement,

Mr. Vail stands at the left in this 1878 photograph taken in Lowell, Mass.

previously quoted which sounded the warning that public opinion has control at the last word.

The obligation of A. T. & T. in serving and satisfying the public were again repeated in the 1911 and 1912 annual reports. Under a section entitled "Public Relations," Vail in 1911 commented on the company's interest in working out the problem of the telephone and telegraph* so that they would meet with the approval of the public as a whole. He wrote:

> We believe that we are working this problem out on the broad lines of the greatest benefit to the public, and that this is evidenced by the fact that our standards and lines of organization and operation are the standards the world over.
>
> As a corollary to this – we recognize a 'responsibility' and 'accountability' to the public on our part, which is something different from and something more than the obligation of other public service companies not so closely interwoven with the daily life of the whole community.

Vail considered these two paragraphs to be of such importance that he quoted them in the 1912 and 1915 reports.

These reports were not merely words with nothing to back them up . . . Herbert Casson, writing in *World's Work*, stated that when Vail became president:

> A policy of publicity superseded the secrecy which had naturally grown to be a habit in the days of patent litigation.

* A. T. & T. obtained control of the Western Union Telegraph Company in 1909, and relinquished it in 1914.

> Visitors and reporters found an open door. Educational advertisements were published in the most popular magazines. The corps of inventors was spurred up to conquer the long-distance problem.

These exact words are found in a December issue of *Harper's Weekly* only a few months after Casson's article appeared. Stehman, commenting on the period from 1908 to 1916, remarked:

> They accept a broader, more farsighted view of the proper position of this great industry in our industrial and social system. Consequently there results the elimination of certain irritating practices and the introduction of bureaus for keeping in touch with the public.
>
> The responsibility and credit for the change should go very largely to the man who was elected to the presidency of the American Company in the year 1907.

Earning Favorable Public Opinion

VAIL farsightedly realized that favorable public opinion had to be deserved, and could only be obtained by giving efficient service and presenting to the public full and honest information. In an article in *Cosmopolitan* he said: "If we don't tell the truth about ourselves, some one else will."

Yet Vail also knew that before the company could satisfy the public it had to know what the feelings of the public were. The desire to satisfy the public led to efforts to discover causes for the existing conflicts through orderly attempts to answer complaints. Writing in *Business* magazine in 1911 he said: "It seems to me that here is the secret of success or failure — this thing of not only looking before one leaps, *but looking thoroughly* before so doing."

The year 1913 was an important one as far as the development of Vail's ideas on public opinion and the public interest.

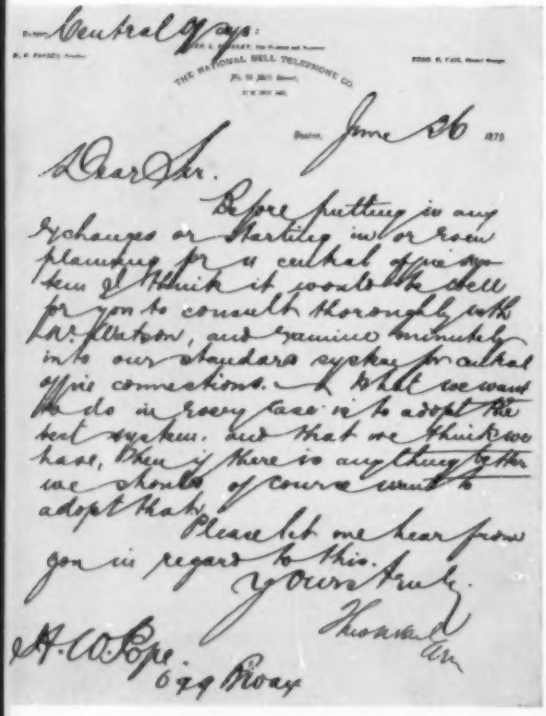
In March an article by Vail entitled "Public Utilities and Public Policy" appeared in the *Atlantic Monthly*. Once again he pointed to the unique relationship which existed between the telephone business and the public when he said:

> The relation of the telephone system to the public is unique in that there is no other public utility or public service which occupies quite the same relation to the public that the telephone does; and in this country the relationship has acquired additional importance as a public necessity owing to the development of the service, the use made of it, and the dependence upon it by the public in its business and social relations.

He noted that utilities were dependent upon public support to obtain customers, but were even more dependent upon the public good-will and favor in order to obtain franchises from the public or its representatives to continue operating. Utilities along with other American corporations were slow to realize this point and many realized it too late.

This article also contained a statement of Bell System policy:

> To develop the possibilities of the service and to give the best possible service; to anticipate all the reasonable demands of the public as to service, either as to quality, quantity or extent; to distribute the charges for such service in such a manner as will make it possible for every one to be connected who will add to the value of the service to others; to collect gross revenue only sufficient to pay a fair dividend on the capital invested, after paying the fairest possible wages for the best service, after providing sufficiently for the maintenance and reconstruction of the plant, whether from decay or depreciation or from obsolescence.



Central Ohio:

THE NATIONAL BELL TELEPHONE CO.

Boston, June 26 1879

Dear Sir.

Before putting in any exchanges or starting in for new plantings for a central office system I think it would be well for you to consult thoroughly with T.D. Watson, and examine minutely into our standard system for central office connections. What we want to do in every case is to adopt the best system. And that we think we have, then if there is anything better we should of course want to adopt that.

Please let me hear from you in regard to this.

Yours truly.

Theodore Vail

H.A.C. Pope.
679 Broadway

"What we want to do in every case is to adopt the best system . . ."

A more comprehensive statement of policy was issued by Vail in August of the same year. The title of the statement "Mutual Relations and Interests of the Bell System and the Public" in itself was noteworthy. It is of enough significance to be quoted in part here:

> We have found, or thought that we had, that our interests were best served when the public interests were best served; and we believe that such success as we have had has been because our business has been conducted on these lines.
>
> We believe that our company has an interest as vital as that of the public in the proper administration of the problems of electrical intercommunication. The success and prosperity of our company depend upon a solution of these problems which shall be sound from both the standpoint of the company and the public which it serves.
>
> Following our own best judgment, supplemented by the best obtainable advice, we have endeavored to do what would best serve the public interest; wherever possible our plans have been disclosed to the public in advance, and what has been done in carrying them out has been along ordinary business lines, with the implied and generally with the expressed approval, authorization, or consent of the municipal and state authorities directly interested. Our effort has been not only to obey the law but to avoid everything which might even have the appearance of an attempt at evasion.

Educating the Public

One other significant talk in 1913 was an address by Vail at the opening of the annual conference of the Bell Telephone System. The purpose of the address was to point out the necessity of educating the public – the public, according to Vail, "upon which we are dependent for good will and even our continued existence." He points to improvements being continually made by the Bell System with which the public were totally unfamiliar. Vail showed his broad understanding of communication and public opinion in this talk when he said:

> Remember: one reading or once hearing never educates. It is only constant repetition and frequent seeing that makes lasting, effective impression on the mind. Remember that education comes more readily through the eye than through hearing or reading. Let the public see some of the daily workings and understand them.

Summing up the task ahead of informing the public of the operations and problems of the Bell System, Vail said:

There has been, and is being, some effort made, but not enough, to make them understand these things; and until the public does understand, and until the public mind is given an opportunity to fully comprehend what has been done, what is being done, and the possibilities of what may be done, public service and utility corporations will not have easy times.

This information provided for the public would be, in the words of Vail, "absolutely correct." He knew that falsehoods through actual lying or through concealment would

Subject re information as to service, rates &c.

THE AMERICAN BELL TELEPHONE CO.

TYLER H. VAIL, General Manager

WM. FORBES, President

Personal

18 MILK STREET

P. O. DRAWER 2

W. A. Leary, Esq. Boston, Dec. 29th, 1883.
Iowa Union Tel. & Tel. Co.
Davenport, Iowa. In reply to yours

Dear Sir : -

Now that the Telephone business has passed its experimental stage, I would like to get your opinion upon points given below. This opinion to be based upon our existing relations, and upon your own and your associates observation and experience in your particular field : -

Is the Telephone service as it is now being furnished, satisfactory to the public.

Are the prices satisfactory to the public, considering the facilities and service that is given.

Would it be advantageous to furnish the same service now being furnished at any lower rate provided it could be done.

Is it possible in view of the contingencies of storm, under ground legislation &c., to make any lower rate to the public for same classes of service.

Is it desirable, and what would be the most practicable way, to provide a service at a rate which would be within the reach of families, etc,.

Is it practicable to give different classes of service within the same Exchange.

What has been the tendency of the relationship between the public and the local Co's., for the past year is., are the relations between the public and the Co's. improving.

Where there has been any conflict between the local Exchange and the public, what has been the cause of the difficulties, and what has been the result.

A full and detailed reply from you by the 8th, of January, would be of great service to me. Trusting that I am not asking too much,

I am,

Very respectfully, &c.

Vail

An early statement of Vail's broad concept of the importance of public relations.

only result in misunderstanding and eventual discovery.

Adhering to his belief in repetition, Vail repeatedly stressed in the 1914, 1915, and 1916 reports the necessity of efficient service in the public interest, responsibility, frankness, the importance of public opinion, and the repetition of facts to prevent misunderstanding. Misunderstanding, he believed, resulted from either "misleading, mistaken or meager information." Showing the ultimate respect for public opinion, he said it has "almost if not quite the force of public law . . ."

The 1917 annual report said that "nothing possible to be done to ensure good service should be left undone" and that good service was a three-way situation between the caller, the called, and the telephone system.

An Example for American Business

AFTER THE OUTBREAK of World War I and especially after the United States entered the war, there was continual discussion and pressure to bring all communication systems under government control. From August 1, 1918, to July 31, 1919, the Bell System was under government control. Consequently, the 1918 annual report was devoted largely to the company's relationships with the government.

Shortly before the Bell System was returned to private control, Vail resigned his position as president to become chairman of the Board of Directors. This was in June of 1919. In this month A. T. & T. issued a twenty-two page pamphlet, written by Vail, which restated company philosophy and policy. In this pamphlet Vail once again emphasized that the public demanded the very best possible service and that the Bell System wanted to provide the service that the public desired.

Thus through his words and actions Vail set an example for American business. He proved to business that it was good business, in fact the best, to satisfy the public. Vail made the American Telephone and Telegraph Company "the best, the most service conscious organization of private enterprise in the country."

(To Be Continued)

Bell System Science Series will continue on TV with new programs on linguistic science, the measurement of time, and genetics.

SCIENCE SERIES TV PLANS MADE THROUGH 1959-60

WILLIAM E. HAESCHE, JR.

Advertising Manager — TV and Radio, PUBLIC RELATIONS DEPARTMENT, A. T. & T. CO.

THE SCIENCE OF LINGUISTICS, the measurement of time, and the study of genetics will be the subjects for the next three programs in the Bell System Science Series on television. These are expected to take the series through the 1959-60 season. Like "Gateways to the Mind," which was telecast on October 23, these next three Science Series programs are being produced for the Bell System by Warner Brothers.

The first of the three, "The Alphabet Conspiracy," will be telecast on Monday evening, January 26, over the NBC television network. The program on the measurement of time is planned for telecast in the fall of 1959, and that on genetics is planned for the winter of 1960.

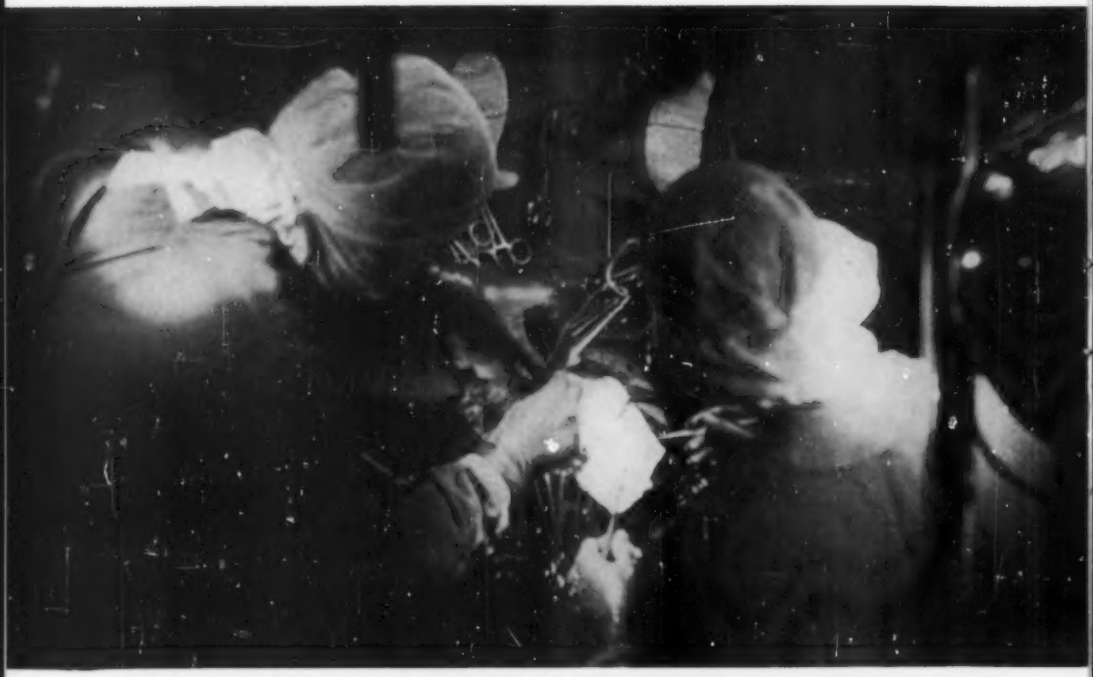
"The Alphabet Conspiracy" will be especially interesting to people in the telephone business because it deals with the scientific study of man's basic method of communication, his language. The story concerns three people who plot to destroy the alphabet and, therefore, all language. But they give up their plans when Dr. Linguistics, the scientist in the program, explains some of the basic facts about language that have been developed by the science of linguistics.

In the first place, Dr. Linguistics points out that the basis of all language is the sounds of speech rather than the letters of the alphabet. In other words, language is essentially spoken rather than written, because man has been speaking for 70 times as many centuries as he has been writing. Even today, millions of people throughout the world have no written language.

"The Alphabet Conspiracy" presents X-ray motion pictures to show the human speech-producing mechanism in action. These show not only the vibration of the vocal chords but also the operation of the tongue, teeth, and lips in forming the sounds of speech.

The program also shows how both animals and human beings can communicate without language. This serves to point up the fact, however, that only language gives man the versatile and flexible medium he requires for the full expression of the power of his brain.

At the end of the program are presented



In this scene of an actual brain operation from "Gateways to the Mind" Dr. Wilder Penfield, of Montreal, noted brain surgeon, shows how sensations can be elicited by direct electrical stimulation of the brain.

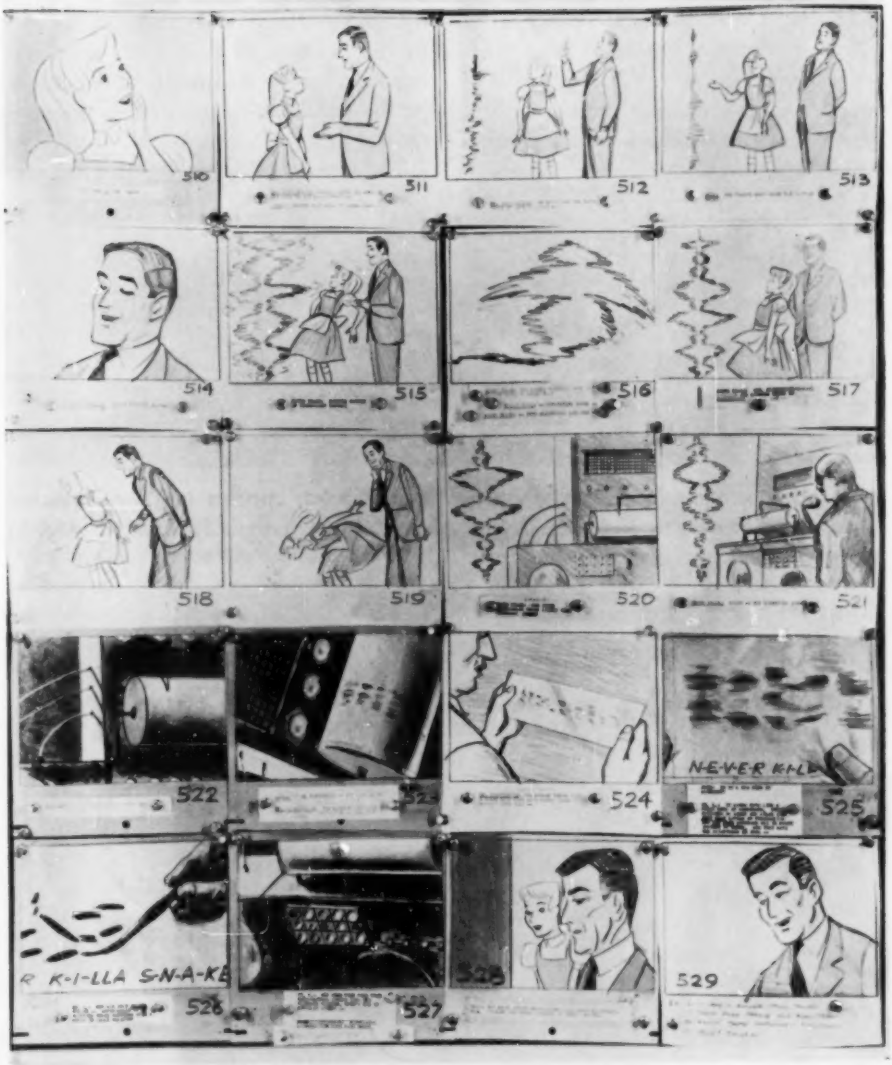
some of the modern instruments developed by scientists both to study and to use speech. One of these is the sound spectrograph, developed by the Bell Telephone Laboratories, in which speech is translated into visible forms which can be studied for the isolation of its essentially significant and insignificant elements. These studies are part of the continuing research in telephonic communications.

The Bell System Science Series program about the measurement of time has been blocked out and will go into production this winter. This subject has been selected because the measurement of time has been and will continue to be basic to all scientific development.

The progress of man's comprehension of time is a fascinating subject. It starts, in all probability, with primitive man's division of immediate time into darkness and light and longer range time into the cycles of planting and harvest. Today, scientists can divide immediate time into billionths of a second and long range time into billions of years.

The program will include a presentation of some of man's devices to "tell" time, starting with the sun dial and the hour glass and coming down to the atomic clocks of the present day. Man's development of the calendar to mark the long range passage of time will be presented.

Some of the more advanced concepts of time will also be shown. One of these is the relativity theory, in which the passage

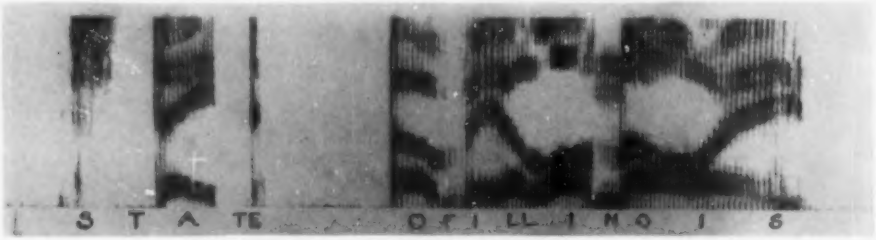


Every scene in a Science Series program is visualized during the planning stages in many drawings like these for "The Alphabet Conspiracy." In this sequence the sound track is called in to show itself (512), becomes an animated character (516), and then explains how scientists make speech visible in the sound spectrograph (520-7).

of time is dependent on location; for example, in a gravitational field the man closest to the center finds everything running slower than the man farther away. There is also the possibility that when space travel becomes practical it will be found that time for space travelers will go much slower than time for those who remain on the earth.

The outline of the Science Series program on genetics is now under consideration by the Scientific Advisory Board. It will present the very beginning of life and the explanation of how each individual organism can be completely different and yet be predicted in most of its essential details.

The secret, of course, is inheritance,



A sound spectrograph, developed by Bell Laboratories, appears in "The Alphabet Conspiracy." It changes the sounds of speech into distinctive visible forms in order to study the significant elements of speech.

Plotting to destroy language, in "The Alphabet Conspiracy" the Jabberwock, the Mad Hatter, and Judy discuss their plot with Dr. Linguistics — who foils it.

Producers of Science Series programs meet regularly with the Scientific Advisory Board to discuss future programs. Dr. Ralph Bown is chairman.

and the program will show the work of Mendel and his formulation of the laws of inheritance. It will also show the physical and chemical bases of inheritance, how traits and characteristics are passed down from one generation to the next. The program will also explain mutations and how inherited characteristics can be modified for beneficial effects.

All life evolves with the passage of successive generations. The hope of the science of genetics is that it can give to man the privilege, and the responsibility, for making his own evolutionary future.

Four elements of destruction combined to make the first "New England hurricane" in over a century a fearful event which lingers still as a grim memory

THE GREAT HURRICANE OF TWENTY YEARS AGO

THE PAST TWENTY YEARS have witnessed a succession of destructive hurricanes along the Atlantic seaboard. More recently they have lost their novelty if not their dread violence, and it has even become customary to identify each year's succession of such storms with feminine names in alphabetical order.

But it was not so twenty years ago. Then occurred *the* New England hurricane of 1938.

It's an old story now. But two decades ago it was very different. Nothing like that attack had happened there in a century. It killed people by hundreds and frightened many thousands. The savagery of the wind was augmented in many places by other elements of destructiveness. Damage of every kind was incalculable.

Damage to telephone plant was calculated eventually – but first it was restored. Some salutary lessons were learned. It is notable that, as a demonstration of System organization, for the first time telephone crews rallied to the stricken area from as far as half way across the country.

To the new generation of telephone men and women, the New England hurricane of 1938 is something that happened a long time ago. To those whom it affected, it is a grim recollection. It is history now, and an anniversary this Fall, and so an appropriate topic for a brief backward glance.

The paragraphs which follow are quoted from "The Bell System Meets its Greatest Test," published in the BELL TELEPHONE QUARTERLY of October 1938:

HURRICANE. FLOOD. TIDAL WAVE. FIRE. These are the Four Horsemen of Destruction which Nature turned loose last month to ride in swift fury across the northeastern part of this country. Behind them they left stricken some of the most thickly populated and highly industrialized sections of the nation, and some of the most beautiful. While not at any one time and place did all four march flank to flank, their path –

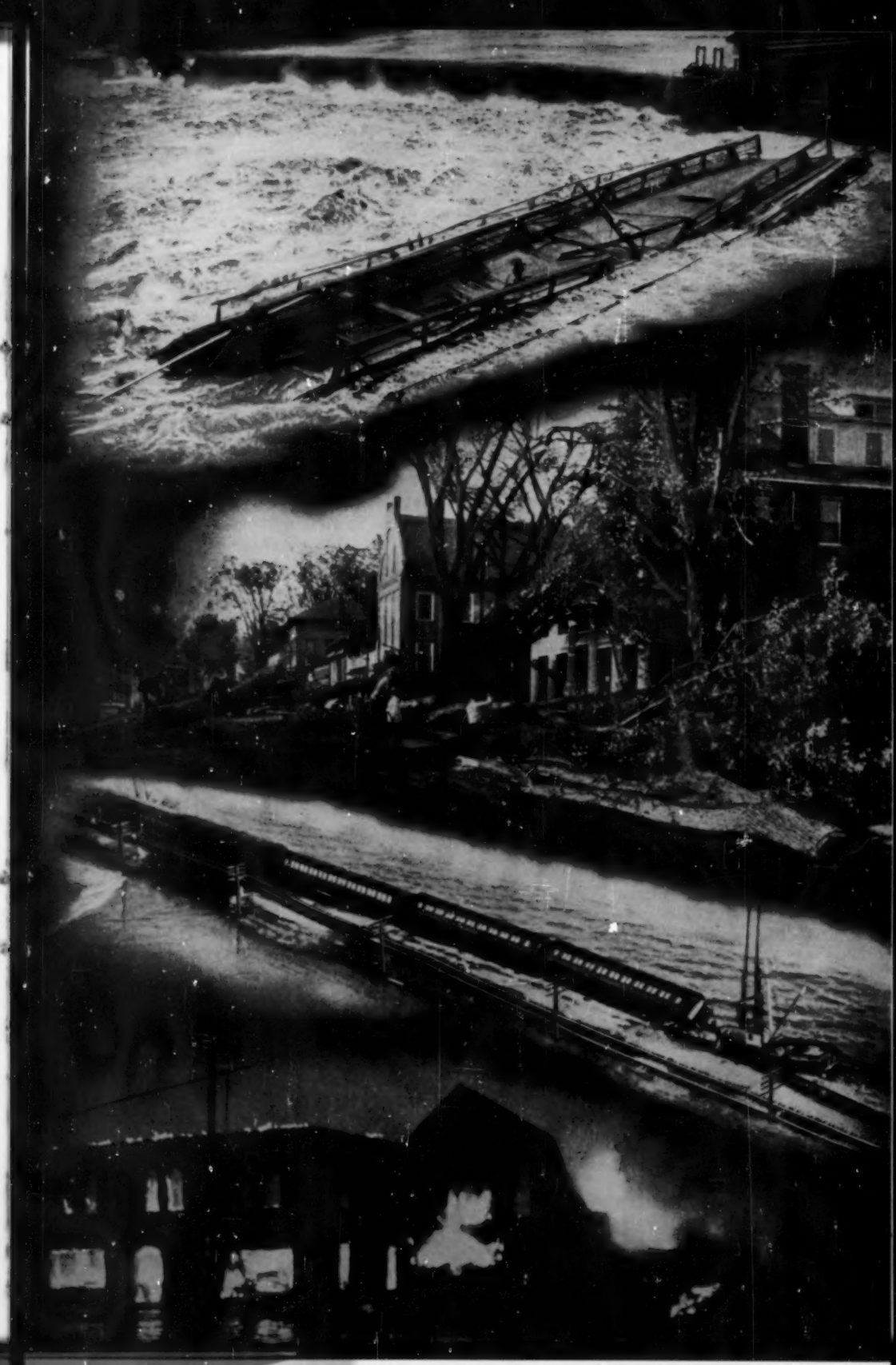
OPPOSITE: FROM THE BELL TELEPHONE QUARTERLY OF OCTOBER 1938:

FLOOD—*The Connecticut River takes a highway bridge down stream at Chicopee Falls, Mass.*

HURRICANE — *A typical New England scene after the storm's passing, in Windsor, Vt.*

TIDAL WAVE—*Its aftermath on the main New York-Boston railroad line near Stonington, Conn.*

FIRE—*It added its terror to that of hurricane and tidal wave in New London, Conn.*



whether singly, paired, or three abreast – was marked by loss of life (the total now approaches 700); by destruction of homes and property; by damage to business and industrial structures, to utility plants and systems, to rural and agricultural areas, to every means of communication. Where went these forces, there devastation never before experienced in that part of the world remained.

There remained, inevitably, a wreckage of telephone plant which confronted the Bell System with the greatest test it has ever been called upon to face: a test of its organization, of its men and women, of its resources of equipment and supplies – of its ability to keep lines of communication open under inconceivably difficult circumstances and to restore the service over a vast territory as quickly as the recuperative powers of a nation-wide System make possible.

THERE WAS, to begin with, rain. It came down intermittently at first, then steadily, for several days – beginning, in New England and eastern New York, on Saturday night, September 17. Suddenly – unexpected, unforeseen – there were, along the hilly watersheds, floods. Tributaries spilled their overflow into every low place, hurried their bulk of racing water into the bigger rivers of the region, and, almost overnight, there was a flood. Strangely, it was the "little rivers" – the lovely New England streams beloved of trout-fishermen – which did the great share of the damage. Throughout this upper New England area, the height of water and the damage done by these lesser streams greatly exceeded that of the record flood of 1936.

Meanwhile, and far from all this, trouble of another kind was brewing.

Out somewhere off the West Indies a tropical hurricane came into being. On September 18 the Weather Bureau announced its birth, predicted its rate of progress in a generally westerly direction, emphasized its severity. Three days later, on the afternoon of September 21, that hurricane, having traveled a path outside all the experience of the Weather Bureau and increasing in violence as it went, struck the northeastern Atlantic seaboard.

Its center of greatest violence passed over the central and eastern part of Long Island, struck the New England coast in the general area between Saybrook, Conn., and Westerly, R. I., progressed northward over eastern Connecticut and western Massachusetts into New Hampshire, in that state veered slightly to the west across upper Vermont, entered Canada apparently in the region between Montreal and Quebec, and passed thence into the wilderness above – and out of this picture. Sustained wind velocities of from 90 to 120 miles per hour were reported at various points; and at the Blue Hill observatory of Harvard University, just outside Boston, a gust of 186 miles per hour was registered.

This was the path of the *center* of the storm. Its total extent was, of course, widespread. Winds of gale force extended roughly from the northern shore of New Jersey to Cape Cod, along the seaboard, and covered a like area as the storm proceeded north. With them they brought torrential rains to add to the already flooded streams.

AS IF not satisfied with what havoc it could create alone, the hurricane brought with it a "tidal wave," its height variously estimated at from 15 to 30 feet and of force immeasurable, to ravage and inundate the seacoast from Long Island and

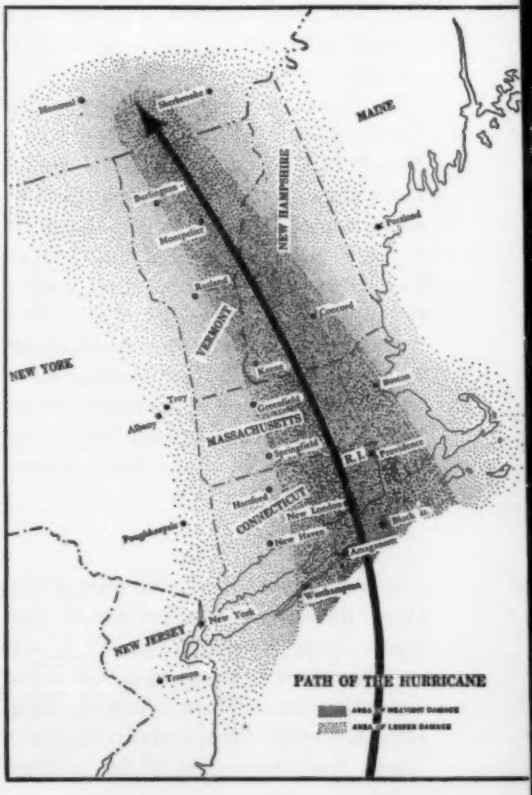
central Connecticut to the tip of Massachusetts. In many places it left the coast line almost unrecognizable. It completely erased whole shore communities. Wherever its resistless might struck, the tidal wave carried devastation on its crest. Linked as it was with the worst of the hurricane, the conditions which followed its recession are indescribable.

Fire was purely localized tragedy, of course. Springing to life among heaps of wreckage or in wind-shattered buildings, it threatened in several communities, large and small, to become holocaust. In each locality so endangered, the fear of conflagration increased the confusion, the uncertainty, the sense of hazard. From the telephone standpoint, fire peaked higher the traffic load at local switchboards, melted a cable here and there, complicated still further the task of restoration – relatively, minor difficulties in the vast whole of trouble.

In New Jersey, 35,000 telephones were out of service. In New York the number was 56,000, of which 30,000 were in the Long Island Area and 15,000 in the Upstate Area. Connecticut's loss was 105,000. In the rest of New England the out-of-service report reached a disheartening total in excess of 300,000. For the two New England companies, the telephones 'out' amounted to approximately 25 per cent of their combined total telephones. Numerically, the telephones out of service in the four companies came to about half a million.

Traffic, it scarcely need be said, leaped upward to new peaks even as the wires to carry it decreased to half or less at many points and – in some particularly hard-hit communities – practically to zero.

The A, B, and C cables between New York and Boston – the 'underground' backbone of Eastern seaboard communication – failed on Wednesday morning (before the hurricane, be it noted) when a normally well-behaved stream went berserk and demolished a bridge at Atwoodville, Conn., a few miles above Willimantic, which carried the cables across. A section of an important route between Norwich, Conn., and Providence, R. I., was practically demolished, as was the New Haven-Providence line which runs along the shore, mainly by falling trees. The Springfield-Albany cable and the most important cable route entering Vermont were severed when a bridge over the Connecticut River at Chicopee Falls was carried away. Lines entering Vermont from New Hampshire



were also down. So many cities and towns in these two states were temporarily without service that both were for a time virtually 'off the map,' telephonically speaking. A bridge washed out at Wareham, Mass. and severed cable communication with the western part of Cape Cod.

Many telephone buildings served as havens of refuge from terror and peril, especially for people in the smaller towns, and also were put to temporary service as Red Cross stations and as headquarters for relief organizations.

New London, Conn., was desperately crippled. A large brick armory next to the telephone building was blown to pieces. Fire followed the hurricane and tidal wave and raged unchecked to within a block of the central office, where a telephone truck was kept ready to batter down the back fence if at the last moment flames blocked all other avenues of escape.

Providence, R. I., located at the head of Narragansett Bay, was hardest hit of all of New England's big cities. Not only was the force of the hurricane severe; in the low-lying commercial and industrial section, the flood waters of the tidal wave rose six to eight feet above sidewalk level, surging through the first floors of stores, office buildings — all the important central structures of a metropolis. The resultant havoc was beyond description. All normal activities were completely suspended for several hours, and the task of pumping out basements continued for days.

WHEN THE BRIDGE at Chicopee Falls, Mass., succumbing to angry waters, took important cables down stream with it, various means were attempted to get a line across the torrent. These failing, the Long Lines men on the job appealed to the Coast Guard. Soon there arrived by airplane from Rockaway, L. I., a Chief Boatswain's Mate and, with him, a Lyle gun — the device used to shoot a line to a shipwrecked vessel. Standing on the bridge approach, he loaded, aimed, fired. The projectile easily cleared the 700 feet of turbulent river, landed safely on the other side; the light line it carried was intact. With this, rope was pulled across, to be followed in turn by wire and then by strand. Soon linemen were riding this to patch in twist for temporary circuits. By morning a new section of cable, placed and spliced, was supported high above the roaring river. The Coast Guard performed a similar service at a smaller stream near Occum, Conn., using a shoulder gun instead of the cannon type.

Men and materials: those were the vital requirements of the New England and Southern New England companies. Almost at once there appeared on the highways and the wrecked streets of their territories, telephone trucks — singly or highballing in convoy behind police escort — bearing the license plates of distant states. Men: all that could be used. Men: trained in Bell System methods, familiar with Bell System equipment, needing no instruction but only to be shown the task. Men — and their own trucks, their own tools, their own foremen and supervisors. Bell System men!

And, that the record be complete, it should be noted that 42 operators from Philadelphia, Cleveland, Detroit, were brought to New York by train and flown thence to Boston, where they took their places beside their sister operators at the Long Distance switchboard.

Movement of men and supplies into New England was greatly hampered by the interruptions to railroad operation and by the carrying away of bridges, the washing out of highways, the omnipresent blockade of fallen trees. Plant crews, whether local

or of other Bell companies, were often forced to take roundabout routes; were at times entirely debarred from certain areas. Western Electric supplies moving in by truck encountered the same obstacles. Western also shipped large quantities by private car, by airplane, and by boat.

That plant crews rolled into New England from as far south as Virginia, from as far west as Arkansas and Nebraska, reveals at once two things: the urgency of the situation and the extent of the response. In the second week after the disaster, there were at work in New England more than 2300 trained men loaned, with their 615 motor vehicles, by 14 companies, as shown below.

It is an inspiring spectacle, this coordination of effort of every branch of the Bell System toward one end. Associated Companies, Western Electric, A. T. and T. General and Long Lines Department, the Bell Laboratories—their resources of every sort are vast, their spirit is indomitable, their teamwork is unbeatable.

Men and Vehicles from Near and Far

Companies	Crews	Construction and Repair Men	Foremen, Supervisors, Service Men and Others	Motor Vehicles
New York	156	417	85	128
Rochester Tel. Co.	3	14	4	4
New Jersey	56	187	40	47
Penna. & Diamond State	129	317	62	124
C. & P. (Washington)	13	39	4	6
C. & P. of Baltimore City	19	68	15	15
C. & P. of Virginia	18	51	8	14
Ohio	92	224	47	106
Michigan	32	104	34	38
Indiana	38	104	24	26
Illinois	26	84	17	32
Northwestern	40	153	35	33
Southwestern	32	97	25	29
Long Lines	14	66	13	13
TOTAL	668	1925	413	615
Sent to				
New England Co.	416	1267	306	336
So. New England Co.	252	658	107	279

William E. Haesche Jr.

Who's Who & What's What

(Continued from page 3)

partment thereafter he was successively editor of *Ohio Bell*, editorial manager, information manager, and executive assistant. In the Summer of 1955 he transferred to A. T. & T.'s merchandising department as staff assistant. When the customer products planning division was established in the Operation and Engineering Department, Mr. Page became market studies supervisor there. This year, with the establishment of the sales division, his work was transferred to that division and expanded to include marketing planning, about which Mr. Page writes in this issue. While still with Ohio Bell, he contributed "The Service in Toledo Did Not Break Down" to this MAGAZINE for Summer 1955, and more recently "Merchandising Seminars: Learning from Others" to that of Winter 1956-57.

ALTHOUGH March 10, 1958, was MISS CONNIE JEAN CONWAY'S first day as an employee of the Bell System, she had actually spent the preceding seven months studying the American Telephone and Telegraph Company and one of its former presidents, Theodore N. Vail. A native of Birmingham, Alabama, Miss Conway received her B.A. degree in Journalism from Birmingham-Southern College in June 1956. In September of that year she entered the University of Wisconsin under a graduate research studentship awarded by the University's School of Journalism. To complete her requirements for a Master of Science degree in Journalism she wrote her thesis on "The Public Relations Philosophy of Theodore N. Vail," from which we are privileged to publish material. Her second chapter deals with Public Opinion, Public Interest, and Public Service, and will be freely quoted — in two parts — in this and the next issue of this MAGAZINE. A. T. & T.'s Public Relations Department was happy to coöperate with Miss Conway by providing material to aid her research; her statements and opinions are, of course, her own. Miss Conway received her M.S. degree last February and returned to Birmingham, where she is now a staff assistant in the Alabama

Miss Connie Jean Conway

Customer Relations section of the Southern Bell Telephone and Telegraph Company.

A NEWSPAPER MAN before he joined the Southern New England Telephone Company in 1945, WILLIAM E. HAESCHE, JR., handled newspaper assignments in that Company's Public Relations Department until the summer of 1952, when he joined A. T. & T.'s Public Relations Department as public information supervisor. The following year he became customer relations supervisor. In 1954 he became Radio-TV advertising supervisor, and he has been advertising manager, television and radio, since 1957, having charge of television and radio advertising activities. Our issue for Spring 1957 carried his "Our New TV Science Series Performs a Public Service."

AFTER extensive studies and trials, a decision was reached last Fall to change the manufacture of PIC (Polyethylene Insulated Conductor) cables to an EVEN number of pairs. Since polyethylene is an improved insulating material, it is not necessary to include extra pairs in PIC cabies as substitutes for defective ones. Elimination of the extra pair made a new simplified color code for the conductors possible as well as simplification in the make-up of the cables. Any standard size cable up to 900 pairs can be assembled from uniform 25-pair binder groups.

To obtain maximum advantage from the new type PIC cable, it is necessary to revise the pair counts of existing cables to an EVEN count system. Thus, the traditional ODD counts, such as 1718-1818 inclusive, are changed to 1701-1800. This conversion program is now under way and a July 1 check shows that 41% of the Bell System exchange plant is on an EVEN count basis. It is a big job, but big annual savings will come from it.

The objective is to complete the conversion to EVEN counts before significant quantities of EVEN PIC are delivered. Western Electric's new Omaha cable plant is a 100% EVEN PIC plant. It is now in the initial production phase, and by the end of the year will have produced 4 BCF of cable. Western's PIC cable machines at Point Breeze, Kearny, and Hawthorne have been modified, and are producing EVEN PIC.

Large size cables will still be made with paper or pulp insulation and they will still have extra pairs. The extra pairs will not be a part of the pair count, however. The Laboratories are studying economic application of polyethylene or similar insulation for these large size cables too.

HEADQUARTERS SUMMARY

June 15 to September 15, 1958

THE BELL SYSTEM'S trial of public radiotelephone communication to airplanes has been extended for another year by the F.C.C. The F.C.C. has also renewed the licenses of 22 participating aircraft. This trial is being conducted by the Illinois and Michigan Bell Companies with coöperation of the Laboratories. A. T. & T. has before the F.C.C. plans for enlarging the area of the trial by establishing stations in the vicinity of Pittsburgh, Washington and New York, looking toward development of the service on a regular basis.

A NEW Traffic Operating Practice covering recommended procedures to be followed by operators in reporting equipment trouble or indications of trouble to the Plant Department has been sent to the Companies. The principal difference from former procedures is the simplified immediate reporting of each failure encountered instead of the reporting only of those failures encountered on repeated attempts.

The reporting of all failures encountered will, of course, involve additional operator time. However, it is expected that the new practice will result in substantial net System annual savings through reduced ineffectual completion attempts. There will be added savings in more effective circuit and switching machine usage and customers will benefit from better service.

THE AVAILABILITY of transistors has made it possible to provide a common battery telephone set for use on long loops with transmission performance equivalent to the local battery set formerly used. This eliminates the need for providing local batteries and replacing them every year or so. These new sets, requirements for which are estimated at 50,000 annually, will be available by the end of this year. They include a fixed-gain transistor amplifier in the transmitter circuit which provides adequate transmission level even at the reduced transmitter supply current for each long loop. Aside from the transistor amplifier and a new adjustable sidetone network (coded 425C), all other parts of the new sets are similar to those in the commonly used 500-type sets.

AS ANOTHER STEP in the reduction of clerical effort, a recent recommendation to the Companies provides for the elimination of anchors as a separate item in the pole line Continuing Property Records, and generally in the pole location records, as of January 1, 1959. These are basic records maintained on a "put and take" basis showing the quantity and location of major items of telephone plant and equipment. The adoption of this proposal will result in appreciable clerical savings in the Plant, Engineering, and Accounting Departments.

A TESTING PROGRAM is under way to investigate data transmission performance in the System. Test calls are being placed through the regular switched message network between transportable receiving and transmitting terminals at pre-selected locations. Calls are placed initially in the local exchange area and then subsequently in short haul and long distance areas in order to include a cross section of typical telephone connections. Each telephone connection, put up in the regular way, is subjected to a series of tests to determine how well the circuit performs both for voice and for data transmission. The results should indicate how fast data can be sent, how often errors can be expected to occur, and what factors and situations limit data transmission performance.

IT HAS LONG been the practice to place cable terminals in advance of estimated requirements and to pre-terminate a number of cable pairs in accordance with established practices for terminal multiplying. With PIC cable and ready access terminals, the termination of a cable pair is no longer a complex operation that requires special skills and tools. New procedures for selecting and terminating pairs in PIC cable, described in Plant Engineering and Assignment practices recently sent to the Companies, provide for placing terminals and terminating cable pairs only as needed. Under these practices a suitable cable pair may be selected in the line assignment office and connection to the pair may be established by any telephone craftsman. If a cable terminal is not in place, the craftsman installing the telephone may place one. Suitable guides and

restrictions are included to ensure that the usage of the cable will be in accordance with the engineering and transmission plan.

THREE BELL SYSTEM COMPANIES cancelled their refunding plans last August because of a declining bond market and a consequent rise in the cost of new debt issues. They were: New England Telephone and Telegraph Company, which had planned to sell $40,000,000 of debentures on August 26; Michigan Bell Telephone Company, with $40,000,000 of debentures scheduled for sale on September 16; and Southwestern Bell Telephone Company, with $110,000,000 of debentures slated for sale on September 30. All three issues had been intended to refund outstanding bonds.

The rising interest rates that killed these refunding plans resulted from a mid-year switch by the Federal Reserve Board from its policy of maintaining credit ease to a policy of progressive credit restraint. This move toward tighter money has been generally taken to mean that the Board decided that inflation had supplanted the recession as the biggest threat to the economy. And the degree of recovery in business activity so far has given support to the Board's position.

WEST PALM BEACH, FLA. has been selected by Long Lines as the northern terminal site for the projected underseas twin telephone cable system linking the U. S. mainland with Puerto Rico. The cables will actually land at Palm Beach, where they will go underground, next pass beneath the waters of the Intracoastal Waterway, and then go underground again at a building of the Southern Bell Company in West Palm Beach. An additional floor added to this structure will be used to accommodate the terminal equipment of the system.

In Puerto Rico, the cables will terminate in San Juan in a new building of the Radio Corporation of Puerto Rico – subsidiary of the International Telephone and Telegraph Corporation – which is participating jointly and equally with the Bell System in the enterprise.

The cables, intended to supplement the present radiotelephone channels, are scheduled to be laid in 1959 and service is expected to start in 1960.

THE CABLESHIP *Iris* finished shore operations off Clarenville, Newfoundland in late July for the first submarine telephone cables that will link North America directly with the European mainland. Early in the summer, shore work was completed on the eastern terminal at the hamlet of Penmarch on the Brittany coast of France. This is the main segment of the telephone cable which will serve France, Germany, and a number of other European nations. The deep-sea portion of the system will be laid next summer, the scheduled service date being late 1959.

GUADELOUPE, in the West Indies, has been linked by voice with the United States since July 1. Cables with the French island in the Caribbean are routed by radiotelephone via Martinique.

SHIP-TO-SHORE telephone service with the Swiss-owned *Arosa Sky* has been available since August. S.S. *Brasil* of the Moore-McCormack Lines also has had radiotelephone service available since its inaugural voyage of mid-September. Vessels now using ship-to-shore service on the high seas total fifty-four.

CERTIFICATES were recently presented to 65 members of the Bell Laboratories staff in recognition of their successful completion of the Communications Development Training Program. At the presentation ceremonies Dr. Eric A. Walker, President of Pennsylvania State University, spoke to the graduates on the topic "Your Challenge for Development." At the same ceremonies Dr. M. J. Kelly presented two fellowships to Bell Laboratories employees, which will permit them to work toward their Ph.D. degrees while continuing as regular Laboratories employees. The two fellowships were awarded to recognize excellent work in the CDT Program and in anticipation of the candidates' promise as members of the Laboratories technical staff.

WHILE WORKING with the basic problem of the diffusion of gases through various materials, members of the Chemical Research Department of Bell Laboratories came across the fact that under certain conditions helium will diffuse through glass walls more rapidly than other gases. This suggested a commercial method of recovering helium from natural gas, and indications are that the method may be economically practicable. Such problems of permeability and diffusion have been studied at the Laboratories for some time, and the particular work that resulted in the helium-separation method was related to various submarine cable projects. The study had the aim

of understanding the possible diffusion of moisture or dissolved gases into underwater cable repeaters.

J. P. MOLNAR, vice president of the Bell Telephone Laboratories in charge of one of the research areas devoted to military programs, recently was elected vice president of Western Electric and president of the Sandia Corporation. He succeeds James W. McRae, who was elected a vice president of the American Telephone and Telegraph Company. The change became effective October 1.

DIPPING DOWN from the southwestern tip of Alaska and curving upward toward the Kamchatka Peninsula of Russian Siberia, a necklace of islands forms one of America's last frontiers. Here, in a world of fog, wind and rain, a team of technicians and engineers gathered from many Bell System companies works under the leadership of Western Electric to complete the Aleutian segment (Project 540) of the nation's northern radar defense network. The strip of radar outposts, for which Western Electric supplies shipments of equipment and apparatus, will stretch from the Alaskan mainland across the northern reaches of the Pacific Ocean. When completed, they will work in relationship with both White Alice and the original DEW Line (both of which were built by W.E.) to form an unbroken chain of electronic early warning and communications sites across the northern rim of the North American continent.

WESTERN ELECTRIC'S newly-completed Charlotte distribution center in North Carolina opened officially early in September. Pilot operations which were formerly conducted in leased quarters in Charlotte came to a close, and a staff of 150 employees commenced operations in the new building. The new distribution center serves the needs of the Southern Bell Telephone Company in North and South Carolina.

The company purchased 45 acres of land in Upper Merion Township, Pennsylvania as the site of a future distribution center for telephone supplies and equipment for the Bell Telephone Company of Pennsylvania. The new distribution center is about 16 miles from downtown Philadelphia and will supplement facilities now in leased quarters in Philadelphia. Date for construction is still uncertain.

A 22-acre site in Yonkers was cleared of existing structures during the summer preparatory to construction of the new Westchester distribution center. Actual construction will begin in 1959, with completion expected in 1960. The area to be served by the Westchester house is at present supplied by the New York Distributing House, which will serve Manhattan exclusively when the new center is occupied.

The Blue Pencil

STEELWORK reaching toward the sky – buildings of all shapes and sizes stretching to the horizon: that is the symbolic interpretation of present and future which artist John Gaydos places on Howard Phillips' article on telephone buildings in this issue, and the opportunities and responsibilities which confront the Bell System as the nation's biggest builder. Implicit but not subject to visual demonstration is the point that great size is not an end in itself, but only a consequence of the obligation to render good service to the 54,000,000 telephones of this country – as author Phillips has made strikingly clear in his contribution. Mr. Gaydos is a New York painter, a member of the Society of Illustrators, whose techniques equip him well to execute the cover of this issue.

DOES OUR FRONTISPIECE, on page 4, look familiar to you? Do you recognize it, even in this truncated form? For it is half of the cover of the August-September number of A. T. & T.'s *195 Magazine*, which includes an article on System sales and discusses the service items we have, shall have, and perhaps may have to offer to customers to meet their expanding needs for telephone service. As there used, it

The building industry's biggest customer

shows 30 different types of equipment, in full color, on front and back, and represents a considerable feat of assemblage and arrangement. Although we can use only the "front cover" portion, in black and white, it is quite germane to this issue's "Marketing Planning for Sales and Profits," by John H. Page. Incidentally, it is another example of cooperation between editors of A. T. & T. publications produced at that organization's headquarters.

PROBABLY not all our readers see the "Share Owners' Quarterly," which is enclosed with A. T. & T. dividend checks four times a year. It always contains timely discussion of topics of interest to all telephone people as well as to share owners; and, since the discriminatory excise tax on telephone service is of significance to both groups, we quote here the comments included in the "Share Owners' Quarterly" enclosed with the dividend checks mailed on October 10, 1958:

"As you probably know, we have vigorously opposed perpetuation of the 10 per cent federal excise tax on telephone service, which is paid directly by telephone users. This began as a wartime emergency measure and is one of the most discriminatory of all taxes. In fact, telephone service is the only household utility that is so taxed. We recognize of course that this may not be the right time to reduce taxes, but we feel strongly that, when opportunity allows, this is one levy that should be removed. To regard it as proper for the long run seems to us unthinkable.

"Recently, however, a joint committee of state governors and federal officials has renewed proposals under which a portion of the 10 per cent tax on local telephone service would be transferred to the states to help pay the cost of certain state programs now supported by federal grants. What does this mean? It could well mean making this most discriminatory tax a permanent part of both federal and state tax structures – with increasing rather than decreasing tax rates.

"If legislation to this end is proposed in the next Congress, we shall urge against its passage and we earnestly hope that informed public opinion will bring about its defeat."

WHERE WERE YOU in 1938 – and how old were you?

The answers to these two questions will probably determine whether you will have little or no interest in the illustrated article about the hurricane of 1938 which this MAGAZINE carries – or a good deal. For not only was that storm of twenty years ago vastly destructive over a large part of the northeast, but it was the first of its kind within the memory of living men – and it was an emotional shock. People were stunned, shaken. Those who were directly affected then must have recalled last month with regret, even sorrow, the angry ferocity of that unprecedented event.

The editor found in his desk recently an odd reminder of those stirring days of two decades ago. It is reproduced on this page. In his recollection it summons a tale to tell.

By Sunday, September 25, 1938 – four days after the hurricane struck – the major roads in the area were reported passable, and the editor set out from New York to New Haven by train en route to the stricken region. In the latter city he consulted men of the Southern New England Telephone Company who were

Twenty-year souvenir

still standing by at headquarters, and arranged for the temporary use of an automobile. One of these men, as he described conditions and suggested routes, took ink, brush, and cardboard, and lettered the sign shown on the preceding page. When the editor set forth a few minutes later to the east and north, that very sign was affixed to the windshield of the car – and well it served in opening barricades established by local and state police and national guardsmen against sightseers and looters as well as a warning of dangerous roads. Thus equipped, he set out on a four-day circuit of five of the six New England states.

Certain scenes and incidents are still vivid: the armed guardsman who ordered the editor off the pitch-black streets of a harassed city; the man at the service station who used the rear wheel of a bicycle to pump gasoline, since there was no electricity; the undertaker who pleaded for quick restoration of his telephone service because there was special need for it in his devastated area; the manual switchboard with 1,803 white plugs in its 1,853 jacks; the pine forests stripped by the wind of all limbs save a green tuft at the top; the angry surge of rivers under bridges shored up to permit a cautious crossing. these and many others are permanently impressed on the memory.

There have been other hurricanes since. The time since 1938 has taught the Bell System much about facing up to these challenges. One quick measure lies in figures for three of them. In round numbers, that 1938 prototype saw 600,000 telephones out of service, and the restoration required 28 days; the storm of 1944 put 400,000 telephones out of service and they were restored in 12 days; and the 1954 storm knocked out 300,000 telephones and service was restored in 6 days. Hurricanes are never identical, and the problems of restoration are not subject to close comparison; but a broad conclusion possible from the relationship of these sets of figures might be that Bell System skill and power to cope with these natural disasters have multiplied in ratio far exceeding the extent to which storm damage has decreased. For all we know to the contrary, there will be other hurricanes to come, and it is cheering to realize that the Bell System is now so well prepared for them.

Good earnings for the telephone company have a way of being good for the customer, too

Everybody has problems. One of ours is the rather widespread belief that the sure way to low telephone rates is to keep the company's earnings as low as possible.

Attractive as this may seem at the moment, it has distinct hazards for the telephone user. Handcuffing the company limits progress and long-range economies. And will lead to poorer service at a higher price than the customer would otherwise have to pay.

This fact is receiving increasing recognition by the commissions which regulate telephone rates and earnings. But it is not something that concerns the commissions alone. It needs your understanding, too.

Regulation can only work best in the interest of all when it is free to act in the interest of all on the basis of economic facts.

Authorizing good earnings for the telephone company requires wisdom and foresight and sometimes calls for a high degree of political courage. Such action, however, in the long run will return the greatest value to the public.

Fortunately, from the standpoint of the individual telephone user, our increased rate needs, where required, are small. They usually come to not more than a few cents a day on the average customer's bill.

BELL TELEPHONE SYSTEM

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